DOCKET

SUPREME COURT
OF THE UNITED STATES

No. 11-597
Title: Arkansas Game & Fish Commission, Petitioner
v.
United States
Docketed: November 16, 2011
Lower Ct: United States Court of Appeals for the Federal Circuit
Case Nos.: (2009-5121, 2010-5029)
Decision Date: March 30, 2011
Rehearing Denied: August 11, 2011

Questions Presented

~~Date~~~	~~~~~~~Proceedings and Orders~~~~~~~~~~~~~~~~~~~~
Nov 9 2011	Petition for a writ of certiorari filed. (Response due December 16, 2011)
Dec 6 2011	Order extending time to file response to petition to and including January 17, 2012.
Dec 9 2011	Brief amici curiae of National Association of Home Builders, et al. filed.
Dec 15 2011	Brief amici curiae of Pacific Legal Foundation, and Cato Institute filed.
Dec 15 2011	Brief amici curiae of Arkansas, et al. filed.
Dec 16 2011	Brief amicus curiae of Association of Fish & Wildlife Agencies filed.
Jan 13 2012	Order further extending time to file response to petition to and including March 1, 2012.
Mar 1 2012	Brief of respondent United States in opposition filed.
Mar 8 2012	Reply of petitioner Arkansas Game & Fish Commission filed.
Mar 14 2012	DISTRIBUTED for Conference of March 30, 2012.
Apr 2 2012	Petition GRANTED. Justice Kagan took no part in the consideration or decision of this petition.
Apr 23 2012	Consent to the filing of amicus curiae briefs, in support of either party or of neither party, received from the counsel for the respondent.
May 7 2012	The time to file the joint appendix and petitioner's brief on the merits is extended to and including June 22, 2012.
May 7 2012	The time to file respondent's brief on the merits is extended to and including August 24, 2012.
Jun 18 2012	The time to file the joint appendix and petitioner's brief on the merits is further extended to and including June 27, 2012.
Jun 18 2012	The time to file respondent's brief on the merits is further extended to and including August 27, 2012.
Jun 27 2012	Joint appendix filed. (Joint appendix in 3 volumes)
Jun 27 2012	Brief of petitioner Arkansas Game & Fish Commission filed.

Jul 3 2012	Brief amici curiae of National Federation of Independent Business Small Business Legal Center, et al. filed.
Jul 3 2012	Brief amici curiae of Pacific Legal Foundation, et al. filed.
Jul 5 2012	Brief amicus curiae of Owners' Counsel of America filed.
Jul 5 2012	Brief amici curiae of Wolfsen Land & Cattle Co., et al. filed.
Jul 5 2012	Brief amici curiae of Washington Legal Foundation, et al. filed.
Jul 13 2012	CIRCULATED.
Jul 23 2012	SET FOR ARGUMENT ON Wednesday, October 3, 2012
Jul 31 2012	Record received from U.S.C.A. for Federal Circuit. (1 box)
Aug 27 2012	Brief of respondent United States filed. (Distributed)
Aug 29 2012	Record from U.S. Court of Federal Claims is electronic.
Aug 30 2012	Motion for leave to file amici brief filed by professors of law teaching in the property law and water rights fields.
Sep 4 2012	Brief amici curiae of International Municipal Lawyers Association, et al. filed.
Sep 19 2012	Reply of petitioner Arkansas Game & Fish Commission filed. (Distributed)
Sep 25 2012	Motion for leave to file amici brief filed by professors of law teaching in the property law and water rights fields GRANTED. Justice Kagan took no part in the consideration or decision of this motion.
Oct 3 2012	Argued. For petitioner: James F. Goodhart, Little Rock, Ark. For respondent: Edwin S. Kneedler, Deputy Solicitor General, Department of Justice, Washington, D. C.

PETITION FOR WRIT OF CERTIORARI

RECORD AND BRIEFS

11 597

No. _____

NOV 9 - 2011

In the
Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR A WRIT OF CERTIORARI

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QUESTION PRESENTED

Petitioner Arkansas Game & Fish Commission, a constitutional entity of the State of Arkansas, sought just compensation from the United States under the Takings Clause of the Fifth Amendment for physically taking its bottomland hardwood timber through six consecutive years of protested flooding during the sensitive growing season. The Court of Federal Claims awarded $5.7 million, finding that the Army Corps of Engineers' actions foreseeably destroyed and degraded more than 18 million board feet of timber, left habitat unable to regenerate, and preempted Petitioner's use and enjoyment. The Federal Circuit, with its unique jurisdiction over takings claims, reversed the trial judgment on a single point of law. Contrary to this Court's precedent, a sharply divided 2-1 panel ruled that the United States did not inflict a taking because its actions were not permanent and the flooding eventually stopped. The Federal Circuit denied rehearing *en banc* in a fractured 7-4 vote. The question presented is:

> Whether government actions that impose recurring flood invasions must continue permanently to take property within the meaning of the Takings Clause.

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PETITION FOR CERTIORARI

This case presents a compelling opportunity for this Court to clarify takings law by holding that any physical invasion that falls short of a *per se* taking must be weighed upon all the circumstances. Certainly, not every government invasion of property constitutes a taking. But the core Fifth Amendment standards do not suffer the government a free license to temporarily invade private property. The Federal Circuit in this case recognized that rule but concluded that flood waters are different, even when the government increases flooding on one person to benefit others and foreseeably inflicts massive damage. Because a fractured Federal Circuit in this case reversed the Court of Federal Claims' award of just compensation for timber and habitat on the sole ground that the United States' six-year flooding regime was "inherently temporary," the Arkansas Game & Fish Commission respectfully petitions for a writ of certiorari to review the judgment of the United States Court of Appeals for the Federal Circuit in this case. If the Court grants review and reverses, the Commission asks the Court to remand with directions to consider all the facts and circumstances.

OPINIONS BELOW

The precedential opinion of the Court of Federal Claims is reported at 87 Fed. Cl. 594 and reproduced at App. 38a. The precedential opinion of the Federal Circuit is reported at 637 F.3d 1366 and reproduced at App. 1a. The Federal Circuit's precedential order denying panel rehearing and rehearing *en banc* is electronically reported at 2011 WL 3511076 and reproduced at App. 162a.

JURISDICTION

The Federal Circuit rendered its decision on March 30, 2011. The Arkansas Game & Fish Commission petitioned for rehearing *en banc* on May 13, 2011. The Federal Circuit subsequently denied panel rehearing and rehearing *en banc* on August 11, 2011. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

CONSTITUTIONAL PROVISION AND STATUTES INVOLVED

The Fifth Amendment to the United States Constitution provides in relevant part: "[N]or shall private property be taken for public use, without just compensation."

The relevant provisions of the Tucker Act, as codified at 28 U.S.C. § 1491(a)(1), (c), are reproduced at App. 181a. Statutory sections 28 U.S.C. §§ 1295(a)(3) and 1346(a)(2), which further establish the jurisdiction of the Court of Federal Claims and the Federal Circuit, are reproduced at App. 180a. A relevant portion of the Flood Control Act of 1928, as codified at 33 U.S.C. § 702c, is also reproduced at App. 182a.

STATEMENT OF THE CASE

This case raises the question of whether the United States can be held liable under the Fifth Amendment's Takings Clause for physically taking property through temporary flood invasions. From 1993 to 2000, over the Arkansas Game & Fish Commission's ("Commission") warnings and objections, the United

States Army Corps of Engineers ("Corps of Engineers" or "Corps") imposed a temporary flood regime to benefit specific upstream interests by deviating from the approved 1953 Water Control Plan at Clearwater Dam sitting upstream from the Commission's Dave Donaldson Black River Wildlife Management Area ("Management Area"). For the first six years (the last two years being drought years), the Corps of Engineers' actions flooded the Commission's bottomland hardwood forest at a time and to an extent that it could not tolerate, killing and degrading thousands of trees—nearly 18 million board feet—across portions of the roughly 23,000 acre Management Area. In 2001, the Corps of Engineers stopped deviating and abandoned plans to permanently change the Water Control Plan after a test release from Clearwater Dam convinced it of the "clear potential for danger." App. 125a.

After a two-week trial that included eighteen witnesses, a site visit, pre- and post-trial briefing, and post-trial argument, the Court of Federal Claims (Judge Charles F. Lettow) held that the United States owed just compensation of approximately $5.6 million for timber taken, plus an additional $176,428.34 for a regeneration program to address degraded forest habitat that will not recover on its own. On appeal to the Federal Circuit by the government and a cross-appeal by the Commission (as to the regeneration award amount), a split panel (2-1) reversed the entire judgment on a point of law. It conceived a *per se* rule that temporary government action that causes flooding and substantial damage to property can never be a taking if the government does not intend to create a permanent flooding condition. A fractured Federal Circuit subsequently denied rehearing and rehearing

en banc (7-4) in a precedential order with three written opinions. Four of the seven-judge majority that denied rehearing were silent as to their reasons.

A. The Black River Wildlife Management Area

The Management Area is located along both banks of the Black River in northeastern Arkansas. The forests in and adjacent to the Management Area are among the largest contiguous areas of bottomland hardwood forest in the Upper Mississippi Alluvial Valley. They contain diverse hardwood timber species—including nuttall, overcup, and willow oaks—that support a variety of wildlife. In particular, the bottomland hardwood forests of the Management Area provide shelter and food for migratory waterfowl that pass through the areas in the late fall and early winter on the Mississippi River flyway.

In an effort to preserve this unique habitat, the Commission purchased much of the land that constitutes the Management Area in the 1950s and 1960s. The Commission operates the Management Area as a wildlife and hunting preserve with a special emphasis on waterfowl management. Each winter, portions of the Management Area are artificially flooded to benefit wintering waterfowl and to provide recreational opportunities for waterfowl hunting. The Management Area also serves as a valuable timber resource. The Commission systematically harvests mature oak and removes unhealthy or unproductive trees to stimulate the growth of new timber and sustain a diverse habitat. With these management practices in place, the Management Area has become a premier duck hunting area. It is also a popular

location for other forms of hunting, fishing, and bird watching.

B. The Corps of Engineers' Deviations

Clearwater Lake and Dam is located upstream from the Management Area and approximately 32 miles northwest of Poplar Bluff, Missouri. Since 1948, the Corps has controlled releases of water from Clearwater Dam to regulate the flow of the Black River and reduce the flooding of lands along the river. In order to regulate the amount of water released, the Corps approved a Water Control Plan that since 1953 has specified the timing and extent of water releases. These predetermined releases mimicked the Black River's natural flow with pulses of water that typically spill over onto riparian lands and then quickly recede. However, from 1993 to 2000, the Corps implemented a series of consecutive, annually-approved deviations from its established Water Control Plan. These deviations prolonged the dam releases to benefit upstream farmers who wanted to reduce flooding on their properties that had been occurring under the approved Water Control Plan. The slower releases still flooded the Commission's Management Area and then sustained the flooding for unnatural, extended periods during six consecutive growing seasons with the effect that trees growing at lower elevations (e.g., bottomland hardwoods) were inundated at critical times when their roots needed to breathe. Moderate drought years in 1999 and 2000 prevented flooding but wiped out the trees that had lost their root systems from the prior six years' flooding.

The Commission repeatedly objected to the ongoing deviations and warned the Corps that it was causing

significant damage. The Corps nonetheless had begun working to permanently adopt similar revisions to the Water Control Plan. In a draft version of an environmental assessment, it concluded that these releases from Clearwater Dam would have no significant impact because their effects diminish at approximately the Missouri/Arkansas state line. Only after engaging in water-stage testing in 2000 and 2001 at the Commission's urging did the Corps acknowledge the harmful effects of its deviations and decide to abandon its intent to permanently change the Plan. In a March 2001 email, Colonel Thomas Holden (United States Army Corps of Engineers, Little Rock District) reported that the Corps had "confirmed that [the Commission's] contentions are correct" and described the deviations as having "significant impacts to the bottomland hardwoods in the Donaldson/Black River Wildlife Management area." App. 185a-186a; *see also* App. 125a. He further advised his colleagues that "anyone could challenge us in that [the] deviations are not in compliance with NEPA and enjoin us. Blissful ignorance of the preceding 25+ years no longer applies." App. 188a; *see also* App. 99a.

C. The Court of Federal Claims' Findings

Based on the evidence at trial, the Court of Federal Claims, having jurisdiction pursuant to 28 U.S.C. § 1491(a)(1), found that the Commission had suffered a taking for which the United States owed just compensation. App. 161a. After careful consideration of the law and the facts, the court held that "the government's temporary taking of a flowage easement over the Management Area resulted in a permanent taking of timber from that property." App. 129a. In reaching this conclusion, the Court of Federal Claims

made several important findings. Based on numerous precedents from the Supreme Court and the Federal Circuit, it first considered the character of the taking and determined that the Commission had shown that the Corps' releases constituted a taking rather than "isolated invasions that merely constitute a tort." App. 89a (internal quotes omitted). It further found that the government's deviations "so profoundly disrupted certain regions of the Management Area that the Commission could no longer use those regions for their intended purposes, *i.e.*, providing habitat for wildlife and harvest." App. 92a. The court next looked to the foreseeability of the Commission's injury and determined that "the effect of deviations in the Management Area was predictable, using readily available resources and hydrologic skills." App. 99a. Lastly, with respect to causation, the Court of Federal Claims held that the frequency and pattern of flooding demonstrated that the Corps' deviations caused the flooding in the Management Area. App. 114a. The court further determined that the timber survey conducted by the Commission served as "persuasive proof[]" that the increased flooding during the growing seasons resulted in increased timber mortality. App. 122a.

D. The Federal Circuit's Decision

The government appealed and the Commission cross-appealed to the Federal Circuit, and on March 30, 2011, a divided panel (2-1), over a strong dissent by Judge Newman, reversed the judgment of the Court of Federal Claims. In the opinion authored by Judge Dyk with Judge Whyte (sitting by designation from the U.S. District Court for the Northern District of California), the panel majority acknowledged that "if

a particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim." App. 18a (citing *First English Evangelical Lutheran Church of Glendale v. Cnty. of Los Angeles*, 482 U.S. 304, 328 (1987)). It then reached the conclusion that "cases involving flooding and flowage easements are different." App. 18a.

Relying solely on older flooding cases that discuss flowage easements, the panel majority ruled that government-induced flooding that is not inevitably recurring occupies only the category of a tort and cannot, as a matter of law, be a taking. App. 21a-22a. Applying that rule to the Commission's case, the panel majority reasoned that it "need not decide whether the flooding on the Management Area was sufficiently substantial to justify a takings remedy or the predictable result of the government's action, because the deviations were by their very nature temporary and, therefore, cannot be inevitably recurring or constitute the taking of a flowage easement." App. 22a (internal quotes omitted). Encapsulating the binary "yes it's possible/no it isn't" nature of its "permanent/temporary" test, the panel majority explained that the "[t]he condition leading to the 'intermittent, but inevitably recurring' flooding . . . must be permanent. Otherwise, it could not be 'inevitably recurring.'" App. 21a.

Judge Newman strongly disagreed and stated in her dissent that the majority's focus on the temporal aspect of the government's intrusion alone "contradicts the entire body of precedent relating to the application of the Fifth Amendment to government-induced flooding." App. 37a. Citing *Loretto v. Teleprompter*

Manhattan CATV Corp., 458 U.S. 419, 426 (1982) and other relevant precedents, she reasoned that all cases involving temporary government invasions—including flooding cases—are subject to a "complex balancing process." App. 32a. Judge Newman further explained that "no court has held that flooding damage is never compensable if the flooding is eventually stopped, whatever the injury." App. 36a. In particular, she pointed to *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987), as recognizing that flood-induced destruction is a permanent injury that is compensable under the Fifth Amendment. App. 35a. She also criticized the majority's singular focus on whether the Corps' flood control policy was permanent or temporary, stating:

> The question is not solely whether the Corps' departure from the flood control policy of the Water Control Manual was permanent or was abated after six years, but whether the increased flooding caused significant injury before the flooding was abated, such that, on balance, the Fifth Amendment requires just compensation.

App. 36a.

In consideration of these strongly differing opinions, the Commission requested rehearing *en banc*; however, the Federal Circuit denied both panel and *en banc* rehearing on August 11, 2011, in another markedly divided (7-4) decision. No majority opinion was given. Judge Dyk, joined by Judges Gajarsa and Linn, issued a concurring opinion reasoning that the panel majority's opinion did not create a blanket rule that would allow the federal government to avoid

takings liability for any flood-control policy that it labels as "temporary." App. 168a. Hypothetically, the concurrence posited that fifty consecutive and identical one year deviations that cause flooding "might properly be viewed as permanent or 'inevitably recurring'" if the government had adopted them with the intent to create a permanent or recurring condition. App. 169a.

Judge Moore responded in her dissenting opinion joined by Judges O'Malley and Reyna, "With all due respect, the question of whether eight years of deviations are similarly adequate is best left to the fact finder – the Court of Federal Claims." App. 174a-175a. She further pointed out that allowing the Corps' "temporary" label for its deviations to control the takings analysis "elevates form over substance and leads to untenable results with enormous future consequences." App. 171a. Judge Moore questioned: "If a [permanent] flowage easement which is terminated after eight years can be a compensable taking, why can't an eight year flowage easement or eight consecutive one year flowage easements?" App. 174a. Characterizing the majority's holding as "a rigid, unworkable, and inappropriate black letter rule," she concluded that determining whether government action constitutes a tort or a taking requires a "flexible case-by-case approach considering the character of the government action as a whole, the nature and extent of the flooding that was caused, and the resultant damage that occurred." App. 176a.

Judge Newman also authored a written dissent to the denial of the Commission's request for rehearing. In it, she agreed with Judge Moore's dissent and reiterated her previous opinion that the panel majority

has created a *per se* rule (i.e., an injury caused by temporary flooding cannot be a taking) that is "contrary to law and precedent" of the Supreme Court and Federal Circuit. App. 178a. With respect to Judge Dyk's statement that the panel majority has created no such rule, she responded that "a single judge [from the panel] cannot rewrite the words and change the ruling of the court's issued opinion. If anything, such an attempted qualification adds confusion, not clarity, to this precedential decision." App. 179a. Judge Newman added that the panel majority has also created a new rule that it is not necessary in temporary flooding cases to apply the established balancing test to determine whether a compensable taking has occurred. App. 178a-179a. She then cited *Cooper* again as an example where a taking of destroyed timber was found to have occurred although it was always understood that the Corps' project and its effect on the river would not be permanent. App. 179a.

REASONS FOR GRANTING THE PETITION

The Federal Circuit's decision carved out a whole category of physical invasions that the government can make without incurring liability under the Takings Clause. The Takings Clause does not exempt any kind of government action inflicting permanent injury solely because it is not permanent. The Commission petitions the Court to grant review and then reverse and remand for the Federal Circuit to review the Court of Federal Claims' trial judgment under the established analysis.

Once the concept of a physical, government taking was accepted as a claim, the law quickly recognized

that such claims must be viewed on the basis of all the particular facts and circumstances of each. The Federal Circuit's decision upends the Court's bedrock standards and grants the government authority to repeatedly invade by flooding, no matter who it injures, no matter how much damage it permanently and foreseeably causes, and no matter what the other circumstances might be, so long as the government's actions are deemed "only temporary." *E.g.*, App. 27a ("Because the deviations from the 1953 plan were only temporary, they cannot constitute a taking."); App. 169a (Dyk, J., Gajarsa, J., and Linn, J., concurring in denial of rehearing) (hinging the possibility of liability on whether the government intends to create a "permanent or recurring condition"). This decision deserves this Court's review for three reasons.

First, the Federal Circuit's decision cannot be squared with this Court's precedent and so, because of the Federal Circuit's unique jurisdiction, it topples the established Fifth Amendment protections for a large majority of landowners and users within reach of a federal flood control project.[1] *Second*, the Federal Circuit's decision threatens serious practical impacts. *Third*, this petition presents a clean vehicle, unburdened by factual disputes, to clarify that courts must consider all the facts instead of applying a one-factor analysis.

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[1] Only claims against the United States for less than $10,000, and claims against the Tennessee Valley Authority, are excluded from the Court of Federal Claims' and, thus, the Federal Circuit's exclusive jurisdiction. *See* 28 U.S.C. §§ 1295(a)(3), 1346(a)(2), 1491(a)(1), (c).

A. The Court Should Grant Review To Clarify that No Physical Invasion is Exempt from the Takings Clause Solely for Lack of Permanency.

The Federal Circuit's decision contravenes established Supreme Court precedent. This case presents the opportunity to explain that while each physical invasion is different, the Fifth Amendment suffers no *per se* rules permitting any one mode of invasion simply because the government does not permanently repeat it. That the Federal Circuit is sharply divided over this case highlights how much this Court's unifying final word is needed.

1. The Federal Circuit's Permanency Rule Conflicts with Important Takings Decisions from This Court and Lower Courts.

This Court has long recognized that the government can physically take property through temporary actions, even after only a few years of rolling or repeat government actions. In 1946, the Court found a taking in *Causby v. United States* where a one-year airport lease with six-month renewals (beginning in 1942) led to airplane overflights that partially destroyed the landowners' use and enjoyment—they could no longer raise chickens. 328 U.S. 256, 258-59 (1946); *c.f. Kimball Laundry Co. v. United States*, 338 U.S. 1, 3, 13 (1949) (requiring additional elements of compensation for a temporary taking when the government expressly condemned a laundry business on a year-to-year basis from 1942 to 1946). The Court in *Causby* held that the Court of Claims had properly found an easement taken. 328

U.S. at 267. After considering other circumstances in the case, the Court concluded that the only question left was whether the "easement taken [was] a permanent or a temporary one," because there was no real finding of fact as to whether the government intended to permanently use the airport. *Id.* at 268. Precedent, therefore, holds that analyzing whether a property interest has been permanently or temporarily taken actually goes to the proper amount of just compensation, rather than serving as a one-factor *per se* test for whether a compensable taking has occurred. *E.g.*, *Kimball Laundry Co.*, 338 U.S. at 12-14.

It is likewise well-established that the government may take property by imposing reversible flood conditions. *See United States v. Dickinson*, 331 U.S. 745, 751 (1947); *c.f. San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 657-58 (1981) (Brennan, J., dissenting with Stewart, J., Marshall, J., and Powell, J.) ("Nothing in the Just Compensation Clause suggests that 'takings' must be permanent and irrevocable."). Takings can be reversed or abandoned, rendering them temporary. *United States v. Dow*, 357 U.S. 17, 26 (1958); *see also Hendler v. United States*, 952 F.2d 1364, 1376 (Fed. Cir. 1991) ("All takings are 'temporary' in the sense that the government can always change its mind at another time."). The Federal Circuit itself once held that temporary, seasonal flooding caused by a construction blockage can take timber, even when the Corps of Engineers considers the blockage temporary and works to clear it. *Cooper v. United States*, 827 F.2d 762, 763-64 (Fed. Cir. 1987). If the damage is foreseeable, as the Court of Federal Claims found here, no precedent allows the government to physically invade and avoid just compensation solely because its actions are temporary

or because it chooses to abandon what it takes. *C.f.* App. 36a (Newman, J., dissenting).

In the context of recurring flooding, this Court recognized that "such temporary limitations are subject to a more complex balancing process to determine whether they are a taking." *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 436 n.12 (1982). In the Commission's case, a member of the panel majority defended its decision by quoting a different line in *Loretto* that in flooding cases, "a taking has always been found only" in the situation of "a permanent physical occupation . . . ." App. 166a (Dyk, J., et al., concurring in denial of rehearing *en banc*). Standing alone without the rest of the opinion, one might read that line to say that a flood is only a taking when it constitutes a permanent physical occupation, as the panel majority ruled. But *Loretto* plainly says otherwise. The issue decided there was whether small cable boxes installed permanently on a building constituted a *per se* taking. *Loretto*, 458 U.S. at 426. Concluding that it did, the Court discussed flood cases—among others—and noted that permanent and exclusive floods are the only instances where a taking is always found. *Id.* at 428. In other words, only permanent and exclusive occupations constitute *per se* takings. *Loretto* made clear, as Judge Newman pointed out in dissent, that anything less requires looking at all the facts and applying a "complex balancing process." App. 178a-179a (citing *Loretto*, 458 U.S. at 436 n.12).

Even claims for regulatory takings that arise from *temporary* interferences are recognized; they just require an assessment of all the facts. *See Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning*

Agency, 535 U.S. 302, 335 (2002). In *Tahoe-Sierra*, the Court faced a claim that a temporary building moratorium was a *per se* temporary taking. *Id.* at 318. The Court ruled that the claim must be analyzed according to the *Penn-Central* balancing test. *Id.* at 342 (citing *Penn-Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1976)). It expressly "[did] not hold that the temporary nature of a land-use restriction precludes finding that it effects a taking . . . ." *Id.* at 337. Instead, the action's temporal scope "should not be given exclusive significance one way or the other." *Id.* The *Penn-Central* balancing test, even when applied to a temporary regulation like in *Tahoe-Sierra*, would consider as "particular[ly] significan[t]" the "economic impact of the regulation on the claimant." *Penn-Cent. Transp. Co.*, 438 U.S. at 124. If a temporary regulatory claim would consider the impact, it is astounding that the Federal Circuit refused to consider the impact of a temporary physical invasion, especially here where it wiped-out huge swaths of timber and crucial habitat managed for wildlife. *C.f. Loretto*, 458 U.S. at 433 (reiterating that physical invasions are "unusually serious" compared to regulatory interferences); *Pumpelly v. Green Bay Co.*, 80 U.S. (13 Wall) 166, 177-78 (1871) (reasoning that it would be "curious and unsatisfactory" if the Takings Clause were understood to allow the government to "inflict irreparable and permanent injury to any extent" because it somehow "refrain[s] from the absolute conversion of real property").

To hold that *any* form of physical invasion by the government is not protected by the Fifth Amendment based solely on its intended duration falls far short of fulfilling the purposes of the Takings Clause. That Clause requires just compensation to "bar Government

from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960); *see also Dickinson*, 331 U.S. at 748 ("The Fifth Amendment [Takings Clause] expresses a principle of fairness . . . ."). The Federal Circuit's decision squarely contradicts that purpose. Here, it renders irrelevant six years of actual invasions and massive, foreseeable damage. Holding that the government may freely invade temporarily by any mode allows it to do for free what *Armstrong* said the Takings Clause was designed to prevent.

2. The Federal Circuit Inferred a Separate Standard for Flood Cases by Severing Them from the Rest of This Court's Decisions.

While the Federal Circuit recognized that this Court's more recent decisions hold that temporary government action "[i]n general" can lead to a taking, it separated them from older flooding cases that discussed "inevitably recurring" floods. *See* App. 18a. The Federal Circuit then conceived a *per se* rule from those older cases and held that this rule survived every contrary modern decision of this Court addressing temporary takings like *Tahoe-Sierra* and its doctrinal predecessor in *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304 (1987) (holding that the government must pay just compensation even if it rescinds a regulatory taking). Read carefully, the flooding cases just do not stand for the Federal Circuit's rule.

The *Barnes* case, on which the panel majority relied heavily, considered *all* the facts before concluding that

crop damage—which is different from the Commission's situation in that, for example, a single flood would erase a harvest—was consequential until the flooding became "inevitably recurring." *See Barnes v. United States*, 538 F.2d 865, 872 (Ct. Cl. 1976). What the Federal Circuit overlooked in the Commission's case is that *Barnes* did not address a situation of temporary government action. The Commission's situation was not before the *Barnes* court. Likewise, the *Cress* case—where the phrase "inevitably recurring" first arose—*did* find a taking and actually faced facts that established "inevitably recurring" floods. *See United States v. Cress*, 243 U.S. 316, 328 (1917); *c.f. also United States v. Kansas City Life Ins. Co.*, 339 U.S. 799, 801 (1950).

The *Sanguinetti* case—which did not find a taking—considered a host of other factors, such as the speculative nature of plaintiff's evidence and the fact that the government there had actually over-engineered its structure to *prevent* floods in rains beyond the maximum recorded. *See Sanguinetti v. United States*, 264 U.S. 146, 147 (1924). Thus, *Sanguinetti* came nowhere near to identifying any single, dispositive factor. The panel majority similiarly overstated *National By-Products* by providing only a partial quote, ignoring the court's statement in that case that "[t]he [inevitably recurring] distinction . . . is, of course, not a clear and definite guideline. *Compare Nat'l By-Prods. v. United States*, 405 F.2d 1256, 1273 (Ct. Cl. 1969) *with* App. 20a (citing *Nat'l By-Prods.*, 405 F.2d at 1273, for the proposition that "plaintiff must establish that flooding will 'inevitably recur'").

In a footnote, the Federal Circuit additionally distinguished its own opinion in *Cooper*—the flooding precedent most factually similar to the Commission's claims. *Compare* App. 26a n.7 *with* App. 35a (Newman, J., dissenting) (discussing *Cooper*, 827 F.2d at 763-764, as "[b]inding precedent that directly contravenes the court's decision today"). In *Cooper*, the Federal Circuit addressed a 1979 construction blockage that imposed seasonal flooding while the Corps of Engineers tried to clear it. 827 F.2d at 763-764. The Corps succeeded in clearing the blockage in 1984, but the intermittent flooding had killed the plaintiff's timber by then. *Id.* *Cooper* ruled that the government had taken the timber. *Id.* At a minimum, it plainly held that temporary government conditions that intermittently flood *can* take timber. *Cooper*, 827 F.2d at 763. Thus, *Cooper* refutes the Federal Circuit's *per se* rule in this case.

The Federal Circuit majority distinguished *Cooper* on the grounds that it "did not discuss the tort versus taking distinction." App. 27a n.7. That distinction disregards the Federal Circuit's holding that the temporary situation actually inflicted a taking. The Federal Circuit further distinguished *Cooper* on the grounds that it did not analyze whether the government appropriated a "flowage easement." App. 26a n.7. That distinction renders inapplicable the entire line of cases ruling that the government can gain a public benefit by destroying someone else's property. *See, e.g.*, *Armstrong*, 364 U.S. at 48; *see also United States v. Welch*, 217 U.S. 333, 339 (1910) (stating that if the United States only destroyed an interest in land, it "may as well be a taking as would be an appropriation for the same end"). Invoking that line of cases with Federal Circuit decisions in *Cooper*

and *Ridge Line, Inc.*, the Commission argued that even if the Corps' flooding had not appropriated a flowage easement (which it had), the Corps took its property by preempting its use and enjoyment. *See Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1356 (Fed. Cir. 2003). The Federal Circuit's treatment of *Cooper* thus avoided the Commission's preemption theory altogether and allowed the panel majority to rest its decision entirely on "inevitably recurring" language in cases like *Barnes* that actually found a taking of a permanent flowage easement.

The United States itself has never advocated for a *per se* rule. *See* App. 178a (Newman, J., dissenting) (recognizing that "[e]ven the government is uncomfortable with the court's new rule"). As appellant, it argued that the temporary nature of the government's actions was just one factor in the "correct question." App. 192a-193a. That the Federal Circuit applied a *per se* rule that not even the United States advanced as the appellant and treated older flooding cases like *Cress*, *Sanguinetti*, and *Barnes* as dispositive and superseding even later decisions shows how much this Court's reasoned clarity is needed. If each mode of invasion takes the parties down a separate rabbit-hole with its own constitutional precepts, no one can reasonably predict where it will go.

B. The Federal Circuit's Decision Threatens Serious Implications of Unrestricted Government Authority for Temporary Flood Control.

By divining a one-factor rule for flooding, the Federal Circuit carved out a whole category of physical invasions from the Takings Clause's protections.

There is no reasonable way to read the panel majority's decision except as declaring, as a matter of law, that the Takings Clause does not provide compensation when temporary government actions cause flooding that eventually stops. The court squarely ruled that it did not have to consider whether the government's flooding "was sufficiently substantial to justify a takings remedy or the predictable result of the government's action," because the government's actions were "temporary." App. 22a (internal quotes omitted); *see also* App. 23a ("[W]e must focus on whether the government flood control policy was a permanent or temporary policy. Releases that are ad hoc or temporary cannot, by their very nature, be inevitably recurring."); *c.f. also* App. 36a-37a (Newman, J., dissenting); App. 171a-173a (Moore, J., O'Malley, J., Reyna, J., dissenting).

The Federal Circuit's permanency rule means that the government may temporarily manipulate flooding regimes to benefit anyone it chooses and cause substantial, foreseeable damage to others without ever paying just compensation. The Constitution has never endured any such rule, and for good reason. The government is already immune in tort for damages caused by flood control projects. *See* 33 U.S.C. § 702c; *but see Cent. Green Co. v. United States*, 531 U.S. 425, 436 (2001); *United States v. Sponenbarger*, 308 U.S. 256, 264-70 (1939). Thus, under the Federal Circuit's ruling, the Corps need only refuse to make a decision on how it will act even one year from now to avoid any liability. *See* App. 171a (Moore, J., et al. dissenting) ("To allow the government's 'temporary' label for the release rate deviations to control the disposition of this case elevates form over substance and leads to untenable results with enormous future

consequences."). This potentially affects everyone and everything, including wildlife and habitat, that lies up- or downstream of a federal flood control project.[2]

In the Commission's case, its damages include more than $5.6 million worth of timber, $176,428 worth of regeneration costs, and the loss of crucial bottomland hardwood habitat used by migratory birds, wildlife, and recreationists. The Federal Circuit should have to confront the question of whether the government may occupy the Commission's property and inflict such massive and foreseeable damage over the course of eight years without paying just compensation. So far it has not, outside the dissenting opinions of four of its judges who would have found a taking. App. 36a ("No error has been shown in the trial court's view of the facts and law."), App. 172a ("There is no error in [the trial court's] decision.").

C. The Federal Circuit's Permanency Rule is a Legal Issue that is Cleanly Presented for This Court's Review.

The legal issue here is narrow and cleanly presented. Though the Court of Federal Claims compiled an extensive record in this case and made numerous factual findings, on appeal only the dissenting opinions considered all the facts and the merits of the trial court's judgment. *See* App. 36a (agreeing that the Court of Federal Claims properly

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[2] While the Tennessee Valley Authority is excepted from the Court of Federal Claims and, thus, Federal Circuit's exclusive jurisdiction, this decision is at least highly persuasive for those takings claims.

ordered the United States to pay just compensation), App. 172a (same); *c.f. also* App. 30a (Newman, J., dissenting from panel majority, stating that her "colleagues [on the panel] do not dispute" the lower court's findings of permanent damage, preemption of use, and foreseeability), App. 171a (Moore, J., et al. dissenting) ("The facts of this case are quite simple."). The panel majority did not consider any facts other than the temporal scope of the flooding. Thus, the physical takings issue presented for this Court's review is a narrow question of law, not burdened by factual disputes or collateral issues. *C.f.* App. 176a (Moore., J., et al., dissenting from denial of rehearing *en banc* "[b]ecause we miss the opportunity to correct this error of law"). The Commission asks only that the Court instruct the Federal Circuit to consider all the facts and apply the complex balancing test prescribed for claims that fall short of a *per se* taking.

CONCLUSION

For these reasons, the petition for a writ of certiorari should be granted.

Respectfully Submitted,

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November 9, 2011

APPENDIX

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APPENDIX A

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2009-5121, 2010-5029

[Decided: March 30, 2011]

ARKANSAS GAME & FISH COMMISSION,
Plaintiff-Cross Appellant,

v.

UNITED STATES,
Defendant-Appellant.

Appeals from the United States Court of Federal Claims in case no. 05-CV-381, Judge Charles F. Lettow.

JULIE D. GREATHOUSE, Perkins & Trotter, PLLC, of Little Rock, Arkansas, argued for plaintiff-cross appellant. With her on the brief were JAMES F. GOODHART and JOHN P. MARKS, Arkansas Game & Fish Commission, of Little Rock, Arkansas.

ROBERT J. LUNDMAN, Attorney, Environment & Natural Resources Division, United States

Department of Justice, of Washington, DC, argued for defendant-appellant. With him on the brief was IGNACIA S. MORENO, Assistant Attorney General.

Before NEWMAN and DYK, *Circuit Judges*, and WHYTE,* *District Judge*.

Opinion for the court filed by *Circuit Judge* DYK. Dissenting opinion filed by *Circuit Judge* NEWMAN.

DYK, *Circuit Judge*.

The Arkansas Game and Fish Commission ("the Commission") filed a physical takings claim against the United States in the Court of Federal Claims ("Claims Court"), alleging that the United States had taken its property without just compensation. The Commission claimed that temporary deviations by the Army Corps of Engineers ("the Corps") from an operating plan for Clearwater Dam during the years 1993 to 2000 caused increased flooding in the Commission's Dave Donaldson Black River Wildlife Management Area ("Management Area"). This flooding, in turn, caused excessive timber mortality in the Management Area. The Claims Court concluded that the United States had taken a temporary flowage easement over the Commission's property and awarded a total of $5,778,757.90 in damages. *Ark. Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 617, 647 (2009). Because we conclude that the

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* Honorable Ronald M. Whyte, District Judge, United States District Court for the Northern District of California, sitting by designation.

Corps' deviations did not constitute a taking, we reverse.

BACKGROUND

The Commission owns the Management Area, which is located in northeast Arkansas and consists of 23,000 acres on both banks of the Black River. The Commission operates the Management Area as a wildlife and hunting preserve and harvests timber, thereafter reforesting the harvested areas. The Corps completed construction of the Clearwater Dam in 1948. The dam is located in southeast Missouri approximately 115 miles upstream of the Commission's Management Area. The reservoir created by the dam is called Clearwater Lake. The primary purpose of the dam was to provide flood protection.

A

Whenever the Corps constructs a dam, it adopts a water control plan reflected in a Water Control Manual. These water control plans detail release rates, safety features, and other operating instructions. They are required by Corps regulation. U.S. Army Corps of Engineers, Eng'r Reg. No. 1110-2-240, at 2 (Oct. 8, 1982) [hereinafter EM 1110-2-240]. The plans are developed by regional district commanders "in concert with all basin interests which are or could be impacted by or have an influence on project regulation" and then submitted to the Corps for approval. *Id.* at 3, 4.

This case concerns release rates from the dam established by the plan for Clearwater Dam and deviations from the planned rates. The purpose of

regulating release rates is to control the flow of the Black River in order to reduce the adverse effects of flooding in downstream areas. The dam cannot be operated in a manner that completely eliminates flooding because water must be released from the dam, and the released water will, to some extent, cause flooding. If the release rates are lower, the height of the flooding is decreased but the period of flooding is increased. If the release rates are higher, the height of the flooding is increased but the period of flooding is decreased. Apparently, agricultural interests favored a lower release rate even though this would lead to longer periods of flooding, while the Commission and those located near Clearwater Lake preferred a higher release rate to return the lake to its normal level more quickly. As will be seen, the claim here is that the Commission's property was damaged by the temporary adoption of a lower release rate during the growing season, prolonging the release period and damaging trees.

In order to understand the parties' respective positions, it is necessary to describe the background of the 1953 plan and the deviations from that plan that are challenged here. The plan for Clearwater Dam was developed over a period of several years and was finally adopted as part of the Clearwater Lake Water Control Manual in 1953. After the Corps completed construction of Clearwater Dam in 1948, it experimented with release levels for five years. Releases were measured by the maximum height of the water at the Poplar Bluff Gauge in the Black River, which is downstream of the dam but upstream of the Management Area. The first maximum levels at Poplar Bluff during this early period were 12 feet during agricultural season and 14 feet during non-

growing season. The Corps concluded that "operating experience" showed these high releases negatively affected too many downstream areas. J.A. 9865. Therefore, in 1950, the Corps reduced the maximum release levels to 10.5 feet during growing season and 11.5 feet during non-growing season. After three years during which "no consistent problems [were] encountered," the Corps approved the first Clearwater Lake Water Control Manual in 1953.[1] J.A. 9865. Under the Manual's "normal regulation," releases were regulated so that the water height at Poplar Bluff did not exceed 10.5 feet during growing season and 11.5 feet during non-growing season. The maximum release levels at Poplar Bluff allowed for the quick release of water during the growing season, so flooding occurred in short-term waves rather than over extended periods. The Manual's normal regulation somewhat mimicked the natural flooding patterns in the region. During the 1993–2000 period, the Manual's "normal regulation" releases were the same as under the original 1953 plan.

The Clearwater Lake Manual allowed for deviations from the "normal regulation" releases for (1) emergencies, (2) "unplanned minor deviations," such as for construction or maintenance, and (3) "planned deviations" requested for agricultural, recreational, and other purposes. J.A. 9907–08. The deviations in question here fell into the latter category. According to the Manual, the Corps was "occasionally requested to deviate from normal regulation." *Id.* at 9907. Planned deviations had to be approved by the Corps'

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[1] The Water Control Manual was amended in 1972 and 1995, but not in respects involving the release rates of water from the dam.

Southwestern Division, which was required to consider "flood potential, lake and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes." *Id.* As described in the Manual, these requests were for specific activities that required deviations only for limited periods of time, such as the harvesting of crops, canoe races, and fish spawning. Therefore, the approved deviations were by their nature temporary.

The temporary deviations here began in 1993, forty years after the adoption of the Water Control Manual.[2] In 1993, the Corps approved a "planned deviation" from the Water Control Manual's approved releases for a three month period from September 29 to December 15, 1993, lowering the maximum release level to six feet at the request of agricultural interests that desired slower releases to "allow[] farmers more time to harvest their crops." J.A. 8237–38. No permanent change was made to the Water Control Manual at that time. But in the same year, the Corps fostered creation of the White River Ad Hoc Work Group ("White River Group") to "recommend minor changes to the approved regulating plan[s]" for dams across the White River Basin, which included Clearwater Dam. *Id.* at 8242. In other words, the White River Group was to propose permanent changes to approved plans, including the Clearwater Lake Water Control Manual.

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[2] It appears that there were deviations in years before 1993, but none of those is challenged here. Nor, apparently, were they challenged in the past.

The Corps' regulations provided that water control plans "will be revised as necessary to conform with changing requirements resulting from [new] developments." ER 1110-2-240 at 2. The regulations also required that "plans will be subject to continuing and progressive study by personnel in field offices of the Corps." *Id.* Substantive revisions "require[d] public involvement and public meetings," and the Corps was required to provide a report to the public at least 30 days before the meeting "explain[ing] the recommended . . . change . . . explaining the basis for the recommendation . . . [and providing] a description of its impacts." *Id.* at 4a. Moreover, in making revisions, the Corps was also required to "comply with existing Federal regulations," such as the National Environmental Policy Act ("NEPA"). *Id.* at 2, A-1.

The White River Group included private recreational, agricultural, navigational, and hydropower interests, as well as state and federal agencies such as the Commission. The Commission objected to deviations from the approved water releases in the 1953 plan that would lower the release rates because such deviations would prolong the release period. The lower maximum release rates meant that water would evacuate from Clearwater Dam more slowly, causing consistent downstream flooding in the Management Area during the tree growing season. (The tree growing season lasts, on average, from April 4 to October 11 each year, and the "critical months" are June, July, and August.) Higher maximum release rates, on the other hand, would result in short-term waves of flooding that would quickly recede. The Commission specifically complained that the lake was 530 feet deep on April 15, 1994, and that, at the lower maximum rates, it

took sixty days of constant releases for the lake to reach its targeted summertime level, flooding the Management Area for most of that two-month period.

In 1994, the White River Group, unable to recommend permanent revisions to the release plan, proposed a year "interim operating plan" that called for temporary deviations during an eight month period. J.A. 8244. The Corps approved "the proposed interim operating plan" as a deviation from April 1994 through April 1995, allowing deviations from the normal release rates from April through November. *Id.* at 8241. The plan set the maximum target level at 11.5, instead of 10.5 feet, for the first two weeks in April and then set the maximum level at 8 feet for the next month and 6 feet from mid-May through November. In February 1995, when the White River Group again proved unable to propose a final plan, the Corps approved an extension of the "interim operating plan . . . to continue as a deviation" for another 12 months through April 1996, allowing deviations from April to November. *Id.* at 8251. The Corps noted that it would "monitor the effectiveness of the interim operating plan" during that period. *Id.*

In February 1996, the White River Group formed a subcommittee of solely Black River interests ("the Black River Group"), including the Commission, to recommend a plan for Clearwater Dam. The Black River Group also could not reach consensus on a proposed permanent deviation plan for Clearwater Dam. Instead, the Corps approved a new "Interim Operating Plan" proposed by the Black River Group for Clearwater Dam for another 12 months through April 15, 1997, with deviations occurring April through November. The Corps said it would "continue to

monitor the effectiveness" of both the White River and Black River "interim operating plans." *Id.* at 8254. The new Black River Group interim plan differed from the prior interim plan recommended by the White River Group. It set the release rate at 6 feet in June and at 5 feet from July through November. This interim plan lapsed in April 1997, and no new interim plan was immediately adopted, leaving the 1953 Manual release rates in place. The Corps did, however, approve a temporary planned deviation in accordance with the Manual from June 3, 1997, to July 5, 1997, to prevent possible flooding and another temporary planned deviation from June 11, 1998, to November 30, 1998, in response to a request from agricultural interests.

The White River Group disbanded in 1997 when it recommended a final plan for the rest of the White River Basin, but the Black River Group continued to work on a plan for Clearwater Dam. The Black River Group finally recommended a proposed plan on September 15, 1998, and that plan was approved as a temporary deviation for 13 months from December 1, 1998, to December 31, 1999, with deviations occurring during the entire 13 month period. This proposed plan also differed from the interim plans approved in prior years, setting the maximum level at 4 feet from mid-May through November but increasing the maximum level if the lake behind Clearwater Dam filled to a certain volume.

In 1999, the Corps began the process of adopting a revised permanent release plan for Clearwater Dam. In keeping with federal regulations, the Corps prepared an Environmental Assessment ("EA"). An EA is a brief report, without detailed descriptions or data,

indicating possible environmental consequences that can help determine whether a more extensive Environmental Impact Statement ("EIS") is necessary pursuant to NEPA. An EIS is necessary where there is a possibility of significant environmental impacts. In comments made on the draft EA, the Commission objected to the proposed changes to the Water Control Manual. The Corps agreed that the proposed revision would require an EIS under NEPA.

Meanwhile, the Corps approved the continuation of the 1999 deviations for 11 months through December 1, 2000, as "a temporary Water Control Plan." J.A. 8294. In May 2000 and March 2001, the Corps and Commission together conducted tests to determine the environmental impact on the Management Area when certain levels of water were released from Clearwater Dam. In doing so, the Corps confirmed that tree roots would be flooded under the proposed plan, which could potentially damage or destroy the trees. Therefore, the Corps declined to further pursue a permanent revision to the 1953 Water Control Manual and returned to the releases set out in the original Manual.

In sum, after approving a planned deviation in 1993, the Corps approved three different interim deviation plans with different release rates during the period from 1994–2000. During some portions of that period no interim plan was in place. When temporary plans were in place, for all but two years (1999 and 2000), the release rates deviated from the 1953 plan during only part of the year, usually April through November. During this entire 1994–2000 period, efforts were made to propose a permanent amendment to the 1953 plan, but no permanent revision to the plan was ever adopted. The effort was finally

abandoned in 2001, and the un-amended 1953 plan continued to govern. The chart below summarizes the details of these temporary deviation plans.[3]

Plan	Date of Plan	Deviations (and Date)	Normal Regulation
1993 Deviation Request Under Original Plan	9/29/93 - 12/15/93	6 ft (9/29/93 - 12/15/93)	10.5 ft or 11.5 ft[4]
1994 White River Group Interim Plan	4/1/94 - 4/15/95	11.5 ft (4/1/94 - 4/14/94)	10.5 ft
		8 ft (4/15/94 - 5/14/94)	10.5 ft

[3] In the chart, the deviations are described by the targeted water height levels at Poplar Bluff Gauge. Most of the deviation plans also included alternative target levels if Clearwater Lake, located behind the dam, reached certain elevations. For example, under the 1994 interim plan, the target level at Poplar Bluff Gauge from May 15 to November 30 was six feet unless Clearwater Lake became 70 percent full, in which case more water would be released to a target level of 8 feet at Poplar Bluff. For purposes of simplification, these alternative target levels have not been included in the chart.

[4] The normal regulation is 10.5 feet during agricultural season and 11.5 feet during non-growing season.

		6 ft (5/15/94 - 11/30/94)	10.5ft or 11.5 ft
		11.5 ft (4/1/95 - 4/15/95)	10.5 ft
White River Group Interim Plan Extension	4/15/95 - 4/15/96	8 ft (4/15/95 - 5/14/95	10.5 ft
		6 ft (5/15/95 - 11/30/95)	10.5 ft or 11.5 ft
		11.5 ft (4/1/96 - 4/15/96)	10.5 ft
1996 Black River Group Interim Plan	4/15/96 - 4/15/97	11.5 ft (4/15/96 - 5/20/96)	10.5 ft
		6 ft (6/1/96 - 6/30/96)	10.5 ft
		5 ft (7/1/96 - 11/30/96)	10.5 ft
1998 Deviation Request Under Original Plan	6/11/98 - 11/30/98	5 ft (6/11/98 - 11/30/98)	10.5 ft or 11.5 ft

1998 Black River Group Proposed Plan	12/1/98 - 12/31/99	11.5 ft (12/1/98 - 5/14/99)	10.5 ft or 11.5 ft
		4 ft (5/15/99 - 11/30/99)	10.5 ft or 11.5 ft
Black River Group Proposed Plan Extension	1/1/00 - 12/1/00	11.5 ft (1/1/00 - 5/14/00)	10.5 ft or 11.5 ft
		4 ft (5/15/00 - 11/30/00)	10.5 ft or 11.5 ft

B

In 2005, the Commission brought suit against the United States under the Tucker Act, 28 U.S.C. § 1491, claiming that the temporary release rate deviations during the 1993–2000 period constituted a taking of a flowage easement entitling the Commission to compensation. The Commission alleged that the deviations caused repeated increased flooding and damaged and destroyed timber in the Management Area. The United States denied that a taking had occurred. The United States argued that any increased flooding was only temporary and constituted, if anything, a tort rather than a taking. The United States also argued that the damage was not substantial enough to constitute a taking and that the effects in any event were not predictable, again defeating a takings claim.

A hearing was held before the Claims Court from December 1, 2008, to December 12, 2008, in which eighteen witnesses testified. In addition to addressing the nature of the deviations from the 1953 plan (described above), the hearing addressed two other issues: the substantiality of the flooding and the predictability of the alleged damage.

With respect to the substantiality of the flooding, the Commission's testimony showed that the Management Area flooded regularly during the 1993–2000 period, including during the tree growing season. The presence of standing water or saturated soil during tree growing season can weaken the roots of the multiple species of oak trees located in the Management Area, which can also render the oaks more susceptible to drought conditions.

The flooding was not consistent from year to year. The parties' experts disagreed as to the amount of increased flooding. Two experts for the Commission, Drs. Heitmeyer and Overton, testified about the extent of the increased flooding. Both used the height of the Corning water gauge along the Black River (downstream of the Poplar Bluff gauge) as a proxy for when flooding occurred, observing that flooding occurred when the Corning gauge reading was over 5 feet. Dr. Heitmeyer reported that the gauge exceeded 5 feet (the level at which flooding occurred) during the tree growing season about 29 more days per year from 1993–1999 than from 1949–1992. Dr. Overton compared the gauge readings from 1981–1992 to the readings from 1993–1999. He explained that the Corning gauge reached a level where substantial flooding occurred (between 8 and 10.5 feet) an average of 24 more days per year during the tree growing

season from 1993–1999 than from 1981–1992. Dr. Overton's data also indicated that flooding occurred in the Management Area an average of 8.5 more days per year from 1993–1999 during the "critical" tree growing period of June to August.

During 1999 and 2000, the region suffered a moderate drought. Therefore, according to both the United States and the Commission, the deviations during 1999 and 2000 did not have much practical effect because the water flow was low and did not cause flooding. However, the Commission witnesses testified that drought conditions increased tree mortality in the Management Area. Trees weakened by six years of additional flooding during the tree growing season could not survive the drought.

The final question addressed at the hearing was the predictability of the results following the government's actions. The Claims Court found that the Corps was unaware in 1993 that deviations would cause additional flooding in the Management Area. Indeed, one Corps official testified that the Corps believed the downstream effect of the deviations would diminish before the water reached Arkansas. However, the Commission sent repeated letters to the Corps claiming that the ongoing deviations were causing additional flooding in the Management Area and also raised its concerns in the White River Group and Black River Group meetings. Still, in its 1999 draft EA, the Corps would have found "no significant impact" based on the proposed revisions to the plan. The Corps only changed its mind about the effects of the deviations after conducting the May 2000 and March 2001 test releases with the Commission which confirmed the possible adverse impacts on the

Management Area and led the Corps to return to the release rates in the original 1953 plan.

The parties also disputed the issue of causation and the amount of damage caused by the flooding. The Commission's expert testified that half of the damaged trees would die within five years and the living damaged trees were worth half of their original value. The United States argued that this testimony was inadmissible because so-called cruise maps on which the testimony was based had been destroyed and that the expert evidence in any event used unreliable guesses and was inadmissible under the Federal Rules of Evidence and *Daubert v. Merrell Dow Pharmaceuticals.*, Inc., 509 U.S. 579 (1993). The Commission also sought regeneration costs to restore areas suffering from invasions of new wetland vegetation to their pre-deviation condition. The United States contended that the Commission failed to prove the United States' actions resulted in the devaluation from invasive growth and, even if it did, the damages were only consequential.

C

The Claims Court concluded that the deviations from the 1953 Water Control Manual were "interim deviations" that were "approved at various times from 1993 to 2000." 87 Fed. Cl. at 603. The court also found that:

> Certainly no *permanent* flowage easement in the Management Area was taken by the flooding attributable to the Corps' deviations from the operating Plan for Clearwater Dam. [A] *temporary* flowage easement is a

> necessary foundation for the Commission's takings claim, as has always been evident from the Commission's pleadings and proofs."

Id. at 617 (emphasis in original); *see also id.* at 619–20 (finding appropriation was "temporary rather than permanent"). The court concluded that a takings claim could be based on such a temporary activity. *Id.* at 618.

The Claims Court relied on the observations by Drs. Heitmeyer and Overton and determined that the deviations caused a substantial enough increase in flooding to constitute the taking of a flowage easement. It also held that the flooding was the predictable result of government action because with any "reasonable investigation of the effects of the deviations . . . it would have been able to predict" that the deviations would cause flooding and damage timber in the Management Area. 87 Fed. Cl. at 623. The Claims Court also concluded that the increased tree growing season flooding caused increased timber mortality in the Management Area, and therefore awarded damages based on the loss of timber and regeneration costs for some areas that had been inundated by new wetland vegetation. The Claims Court awarded $5.5 million in damages for dead or declining timber, relying on the Commission expert's testimony about the value of the trees.[5] It also awarded $176,428.34 in damages for regeneration costs, but it granted damages only for areas classified as having suffered "severe" rather than "heavy" or "moderate" effects.

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[5] The court rejected the claim that the testimony of the Commission's experts should be excluded.

The United States appealed, contending that no taking had occurred, and that if it had, the damages were overstated. The Commission cross-appealed, contending that the Claims Court should have awarded additional damages for regeneration. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(3).

DISCUSSION

Determining whether a taking has occurred is a "question of law based on factual underpinnings," and as such, we review the Claims Court's legal analysis and conclusion de novo and its factual findings for clear error. *See Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1352 (Fed. Cir. 2003).

I

In general, if particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim. *See First English Evangelical Lutheran Church of Glendale v. Cnty. of Los Angeles*, 482 U.S. 304, 328 (1987). However, cases involving flooding and flowage easements are different. Both Supreme Court precedent and our own precedent dictate that we must distinguish between a tort and a taking. An injury that is only "in its nature indirect and consequential," i.e. a tort, cannot be a taking. *Sanguinetti v. United States*, 264 U.S. 146, 150 (1924). The Supreme Court has long recognized that to be considered a taking overflows must "*constitute an actual, permanent invasion of the land*, amounting to an appropriation of *and not merely an injury to the property*." *Id.* at 149 (emphases added). The Court has stated that an invasion is permanent when there is a

"permanent condition of continual overflow" or "a permanent liability to intermittent but inevitably recurring overflows." *United States v. Cress*, 243 U.S. 316, 328 (1917); *see also United States v. Kansas City Life Ins. Co.*, 339 U.S. 799, 810 n.8 (1950) (quoting *Cress* and finding a taking where the plaintiff's land was "permanently invaded by the percolation of . . . waters").

In *Cress*, the Court found a taking where the erection of a lock and dam on the Cumberland River "subject[ed] [the plaintiff's land] to frequent overflows of water." *Cress*, 243 U.S. at 318. The Court explained that these intermittent overflows showed "that this [was] not a case of temporary flooding or consequential injury," where takings liability would be denied, "but [instead] a *permanent condition*, resulting from the erection of the lock and dam." *Id.* at 327 (emphasis added). It further stated that there was "no difference of kind . . . between a permanent condition of continual overflow [which had previously been found to constitute a taking] . . . and a *permanent liability* to intermittent but inevitably recurring overflows." *Id.* at 328 (emphasis added).

In *United States v. Dickinson*, 331 U.S. 745, 746–47 (1947), the Court also found a taking based on a permanent condition. In *Dickinson*, the United States constructed a dam, and the "water above the dam was . . . impounded to create a deeper channel," thereby permanently raising the river level, "permanently flood[ing]" some of the adjacent land, and subjecting more of it to intermittent overflows. *Id.* at 746–47. Even though Dickinson later "reclaimed most of his land which the Government originally took by flooding," the Court found that the reclamation did not

"change[ ] the fact that the land was taken [in the first place] . . . and an obligation to pay for it then arose." *Id.* at 751. The nature of the government's action remained permanent, even though the reclamation had mitigated some of the effects. Again, the Court distinguished between invasions that were permanent or temporary in character. Summarizing these cases, in *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 428 (1982), the Supreme Court noted that it has "consistently distinguished between flooding cases involving a permanent physical occupation, on the one hand, and cases involving a more temporary invasion . . . that causes consequential damages within, on the other."

Numerous cases from our predecessor court have similarly held that inherently temporary conditions cannot result in the taking of a flowage easement. *See Barnes v. United States*, 538 F.2d 865, 870 (Ct. Cl. 1976); *Nat'l By-Products, Inc. v. United States*, 405 F.2d 1256, 1273 (Ct. Cl. 1969); *Fromme v. United States*, 412 F.2d 1192, 1197 (Ct. Cl. 1969). "The plaintiff must establish that flooding will 'inevitably recur,' in the phrasing of the *Cress* case." *National By-Products*, 405 F.2d at 1273. "[G]overnment-induced flooding not proved to be inevitably recurring occupies the category of mere consequential injury, or tort." *Barnes*, 538 F.2d at 870.

The Commission argues that under our decision in *Ridge Line* a permanent invasion is not required and that appropriation of a "temporary flowage easement" is sufficient. Commission's Br. 39. This argument is without support. A panel decision of this court cannot, of course, overturn Supreme Court precedent or our precedent. In any event, we did not purport to do so in

Ridge Line. The case involved a permanent condition—runoff caused by the construction of a postal facility.[6] As such, we had no reason to address whether an inherently temporary condition could be considered a taking. The holding in *Ridge Line* is fully consistent with the *Cress* case's emphasis on the "inevitably recurring" nature of intermittent flooding.

In *Ridge Line* we noted that the Claims Court had erred in "confin[ing] its analysis of liability to whether the government's actions constituted a permanent and exclusive occupation." 346 F.3d at 1352, 1354 (internal quotation omitted). We concluded that "permanent destruction or exclusive occupation by government runoff is not always required for a successful taking[ ]." *Id.* at 1354. In other words, we explained, the "occupation" need not be exclusive and the destruction need not be "permanent." *Id.* at 1352. "[I]ntermittent flooding of private land can constitute a taking of an easement." *Id.* at 1354. Thus, we confirmed that intermittent but inevitably recurring flooding could constitute a taking and that continuous inundation was not required. *Id.* at 1357. But, citing *Barnes*, we noted that "government-induced flooding not proved to be inevitably recurring occupies the category of mere consequential injury, or tort." *Id.* at 1355 (quoting *Barnes*, 538 F.2d at 870). The condition leading to the "intermittent, but inevitably recurring" flooding, *id.* at 1357, must be permanent. Otherwise, it could not be "inevitably recurring."

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[6] Although the plaintiff later refilled the land eroded by government runoff, *Dickinson*, as discussed above, shows that later reclamation by the plaintiff does not defeat the otherwise permanent nature of an invasion.

Ridge Line also clarified that, in distinguishing between a tort and a taking, courts must additionally consider 1) whether "the government's actions were sufficiently substantial to justify a takings remedy" and 2) whether the harm suffered by the plaintiff was "the predictable result of the government's action." 346 F.3d at 1355, 1356. The *Ridge Line* court relied on *Sanguinetti*, where the Supreme Court found no taking in that case because it was unclear whether any substantial additional flooding actually occurred and whether the overflow was "the direct result of the [canal]" and thus would be reasonably anticipated by the government. 264 U.S. at 149. Similarly, in *John Horstmann Co. v. United States*, 257 U.S. 138, 146 (1921), the Supreme Court found no taking where flooding was caused by the movement of underground percolating waters "which no human knowledge could even predict."

The parties in this case vigorously dispute whether the extent and frequency of flooding satisfied the substantiality requirement and whether it was predictable. However, we need not decide whether the flooding on the Management Area was "sufficiently substantial to justify a takings remedy" or "the predictable result of the government's action," *Ridge Line*, 346 F.3d at 1355, 1356, because the deviations were by their very nature temporary and, therefore, cannot be "inevitably recurring" or constitute the taking of a flowage easement. For this reason, we also need not address the parties' dispute as to the calculation of damages.

II

Most government-induced flooding cases involve overflows caused by permanent structures or improvements, such as dams, canals, or levees. *See, e.g.*, *Dickinson*, 331 U.S. at 746–47 (involving the construction of a dam and the resulting rise in the river level); *Sanguinetti*, 264 U.S. at 147 (involving a canal insufficient to carry away flood waters); *Cress*, 243 U.S. at 327 (involving erection of a lock and dam); *Ridge Line*, 346 F.3d at 1351 (involving runoff caused by construction of Post Office facility); *Nat'l By-Products*, 405 F.2d at 1259–61 (involving a levee built on one side of a creek without a corresponding levee on the other side). Permanent conditions often, but not always, yield inevitably recurring flooding. *Compare Cress*, 243 U.S. at 327 (finding inevitably recurring flooding), *with National By-Products*, 405 F.2d at 1274–75 (finding no taking because plaintiffs did not prove floods caused by levees would inevitably recur).

As with structural cases, in determining whether a governmental decision to release water from a dam can result in a taking, we must distinguish between action which is by its nature temporary and that which is permanent. But in distinguishing between temporary and permanent action, we do not focus on a structure and its consequence. Rather we must focus on whether the government flood control policy was a permanent or temporary policy. Releases that are ad hoc or temporary cannot, by their very nature, be inevitably recurring.

The Commission's entire theory is contrary to governing law. The Commission does not contend that

the deviations from the 1953 plan and the resulting flooding were inevitably recurring. Rather, the Commission contends that temporary deviations are sufficient. In its brief, it contended "that [the fact that] the Corps eventually stopped [the] deviations only render[ed] the taking temporary," Commission's Br. 41, and therefore claims "the [United States] appropriated a *temporary* flowage easement for which it must pay," *id.* at 39 (emphasis added). At oral argument, the Commission similarly argued that it "do[es] not think the law requires [the deviations] to be permanent or that the government intended . . . to make [them] permanent." Oral arg. at 18:17–18:25, *available at* http://www.cafc.uscourts.gov/. It argued again that "the fact that . . . the United States abandoned its easement only makes [the taking] temporary." *Id.* at 20:33–20:41.

The Commission's concession that the government action was temporary in nature is fully consistent with the established facts. The undisputed facts are clear that the governmental action was designed to be temporary and that the Corps never approved a permanent change in the pre-existing flow rates. As discussed above, all of the deviations from 1993 to 2000 were approved only as temporary or interim deviations. The multiple interim plans differed. Even where deviations were the same in consecutive years, such as in 1994 and 1995, the Corps had to approve an extension of the interim deviation plan for the second year.

The Commission itself similarly referred to the deviations as temporary or interim. During oral argument, the Commission noted that when deviations first began they were temporary and made in response

to particular requests by specific interests and that the permanent revisions to the plan were never approved. Moreover, in an internal memorandum summarizing the first meeting of the Black River Group in 1996, a Commission official described the 1994–1995 deviations as "a temporary interim plan." J.A. 9145. In a later memorandum, a second Commission official acknowledged that "[d]uring the years[ ] 95, 96, and 97[,] the so-called interim plan was tried." *Id.* at 2434. Martin Blaney, the Commission's Statewide Habitat Coordinator, testified at trial that an "interim plan" had been used from 1998–2000. Id. at 1811. Similarly, Robert Zachary, the Wildlife Supervisor for the Commission, testified that the Corps' "interim plan of operation" caused tree growing season flooding in 1996. *Id.* at 1687.

Therefore, the numerous deviation plans were inherently temporary, and the Corps, despite considering permanent revisions in 1999, never approved any of the deviations as a permanent policy. In order to make any *permanent* change to the release rates, Corps regulations required compliance with federal regulations. The Corps did not even begin the EA or EIS necessary to comply with NEPA until 1999, and it never completed the necessary steps to implement a permanent revision of the Water Control Plan. As such, the plaintiffs have not met their burden to prove that the increased flooding would be "inevitably recurring" because the deviations were explicitly temporary.

Binding decisions of the Court of Claims, our predecessor court, in *Barnes* and *Fromme* found no taking under similar circumstances. In *Barnes*, the Fort Randall Dam was constructed in 1952, and the

government began to release water "to evacuate the excess water accumulation caused by rains and melting snows" in 1969. 538 F.2d at 868. The releases caused intermittent flooding from 1969–1973 and again beginning in 1975. *Id.* at 868–69, 872. Noting that "the flooding [was] of a type which will be inevitably recurring," *id.* at 872, the court determined that a taking had occurred but held that it did not occur until "the permanent character of intermittent flooding could fairly be perceived" in 1973, *id.* at 873. Consequently, it did not allow the plaintiffs to recover for crop damage sustained from 1969–1973 because it was not obvious that the releases and the flooding would be permanent until 1973. *Id.*

In *Fromme*, the Corps constructed a channel and levee near the plaintiff's property. 412 F.2d at 1194. During construction of this project, from 1965–1967, the defendant maintained a "temporary spoil bank," which caused the plaintiff's land to flood "for a substantially longer time than would have been the case if the spoil bank and partially completed levee had not been in existence." *Id.* at 1195. The court held that no taking occurred during the 1965–1967 period because the spoil bank only "represented a temporary situation," and the channel would not lead to the "inevitably recurring floodings which the Supreme Court [had] stressed . . . in *Cress*." *Id.* at 1196–97. Hence, both *Barnes* and *Fromme* indicate that flooding must be a permanent or inevitably recurring condition, rather than an inherently temporary situation, to constitute the taking of a flowage easement.[7]

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[7] The Commission argues that *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987) is analogous and supports finding a taking in

Because the deviations from the 1953 plan were only temporary, they cannot constitute a taking. The actions at most created tort liability. We recognize that in other contexts the distinction between a temporary and permanent release plan may be difficult to define. The government cannot, of course, avoid takings liability by characterizing inevitably recurring events as merely a series of temporary decisions. Here, however, the Corps' regulatory scheme has itself clearly distinguished between permanent and temporary release rates. The deviations in question were plainly temporary and the Corps eventually reverted to the permanent plan. Under such

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this case. In *Cooper*, during the period that the Corps was conducting construction along a waterway (1979–1984), part of a river was blocked, subjecting the plaintiff's timbered land "to standing flood water for long periods of time during the [growing season]" of that period. *Id.* at 762. The court found that the temporary flooding constituted a taking of plaintiff's timber. *Id.* at 763. However, the court did not discuss the tort versus taking distinction. Moreover, it explicitly noted that its decision was "not controlled by [ ] cases . . . dealing with flowage easements" because the plaintiff had not requested compensation for a flowage easement. *Id.* We have consistently held that panel authority that does not address an issue is not binding as to the unaddressed issue. *See, e.g.*, *Sacco v. United States*, 452 F.3d 1305, 1308 (Fed. Cir. 2006) (finding that a prior case "is not binding precedent on [a] point because the court did not address the issue" in that prior case); *Boeing N. Am., Inc. v. Roche*, 298 F.3d 1274, 1282 (Fed. Cir. 2002) ("[W]e are not bound by [a prior opinion] on the issue . . . since [that] issue was neither argued nor discussed in our opinion."); *see also Brecht v. Abrahamson*, 507 U.S. 619, 631 (1993) (stating that if a decision does not "squarely address[ ] [an] issue," a court remains "free to address the issue on the merits" in a subsequent case). Therefore, *Cooper* does not govern. We must follow cases such as *Cress*, *Barnes*, and *Fromme* as to the test for the taking of a flowage easement.

circumstances, the releases cannot be characterized as inevitably recurring.

IV

For the foregoing reasons, we reverse the Claims Court's decision that the United States had taken a flowage easement on the Commission's land without just compensation.

REVERSED

COSTS

No costs.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2009-5121, 2010-5029

ARKANSAS GAME & FISH COMMISSION, *Plaintiff-Appellee,*	)
v.	)
UNITED STATES, *Defendant-Appellant.*	)

Appeal from the United States Court of Federal Claims in 05-CV-381, Judge Charles F. Lettow.

NEWMAN, *Circuit Judge*, dissenting.

The Court of Federal Claims found that the six years of improper government induced flooding caused substantial damage to the Donaldson Black River Wildlife Management Area. The flooding resulted from deviations from the agreed water release schedule of the Clearwater Dam Water Control Manual, which schedule had been in place since 1953 and had operated, without injury to the preserve, until the Army Corps of Engineers decided to depart from the Manual and to provide increased flooding from 1993 through 2000. The Arkansas Commission raised strong objections, but the increased flooding was not abated. The Court of Federal Claims found, and my

colleagues on this panel do not dispute, that the destruction of valuable hardwood and other injurious changes in the Arkansas preserve were due to these extensive improper flooding activities.

After the continuing protests by the Commission, the Corps of Engineers finally came to investigate in March 2001 and immediately ceased the increased flooding, stating that there was "clear potential for damage to bottomland hardwoods." Transcript of Colonel Holden's Remarks to the Black River Operations Public Meetings, April 25 and 26, 2001. J.A. 9802. However, the damage had already been done.

The Court of Federal Claims, after a two-week trial including eighteen witnesses, documentary evidence, and an actual site visit, held that a taking of property had occurred in terms of the Fifth Amendment, and awarded damages for the losses incurred.[1] My colleagues on this panel now conclude that no taking occurred and no liability ensued, giving the reason that the Corps eventually abated its destructive flooding. In so ruling, the court departs from constitutional right and well-established precedent. I respectfully dissent.

DISCUSSION

This Wildlife Management Area spans approximately 23,000 acres along the banks of the Black River in northeastern Arkansas. The

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[1] *Arkansas Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594 (2009).

Management Area serves as a hardwood timber resource with systematic harvests of mature oak, and also provides habitat for migrating water-fowl and serves as a hunting preserve. The Water Control Plan for Clearwater Dam had been in place for forty years; the water-release plan had been devised after five years of experimental study and interaction of all the interests served by these waters, and served these interests well, until 1993, when the Corps of Engineers began to deviate from the authorized Plan. The Commission repeatedly complained to the Corps that the deviations were causing extensive flooding that was damaging the bottomland hardwoods and other aspects of the Wildlife Management Area. The Corps did not investigate until 2001, when it confirmed the Commission's concerns and returned to the authorized Water Control Plan.

The floodings drove the hardwood ecosystem to a state of collapse, killing most of the red oaks and many white oaks. Although bottomland ecosystems exist with naturally-occurring seasonal flooding and other climate variations, the nuttall oak and overcup oak, in particular, could not tolerate this artificial flood regime that covered the trees' root systems for extended unnatural periods during the growing season, for six consecutive years. The record states that the increased releases in 1999 and 2000 were less injurious because there was a drought, but the damage had already been done.

The Court of Federal Claims found that the government was responsible for the flooding and the injury caused thereby, that "the damage done to the Commission's property interest in its timber was permanent rather than temporary," and that "the

government's superinduced flows so profoundly disrupted certain regions of the Management Area that the Commission could no longer use those regions for their intended purposes, *i.e.*, providing habitat for wildlife and timber for harvest." 87 Fed. Cl. at 620. The court found that "the Corps of Engineers had been repeatedly warned by members of the Commission," and that "the effect of deviations in the Management Area was predictable, using readily available resources and hydrologic skills." *Id.* at 622-23. My colleagues do not dispute these findings. Instead, my colleagues rule that no property interest was taken in Fifth Amendment terms, on the theory that "[b]ecause the deviations from the 1953 plan were only temporary, they cannot constitute a taking." Maj. op. at 25. This conclusion, and the reasoning on which it is based, diverge from constitutional precedent, and contravene the large body of decisions arising from government operations involving water management.

Government-induced flooding is a recognized physical intrusion. The Court has "long considered a physical intrusion by government to be a property restriction of an unusually serious character for purposes of the Takings Clause." *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982). In *Loretto* the Court cited flooding cases to illustrate the constitutional treatment of temporary intrusions, observing that they are subject to a "complex balancing process," *id.* at 436 n.12. Applying this balancing process to floodings, the courts have recognized that "isolated invasions, such as one or two floodings . . ., do not make a taking . . . , but repeated invasions of the same type have often been held to result in an involuntary servitude." *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1357 (Fed. Cir. 2003)

(quoting *Eyherabide v. United States*, 345 F.2d 565, 569 (Ct. Cl. 1965)). When the invasion "preempt[s] the owner's right to enjoy his property for an extended period of time," the principles of constitutional deprivation of property apply. *Id.* at 1356.

Precedent well establishes that when property "is actually invaded by superinduced additions of water . . . so as to effectively destroy or impair its usefulness, it is a taking within the meaning of the Constitution." *Pumpelly v. Green Bay Co.*, 80 U.S. 166, 181 (1872). Precedent does not require constant or permanent flooding, and eventual abatement of the flooding does not defeat entitlement to just compensation; the specific facts must be considered, as for any invasion of property. *See, e.g.*, *United States v. Dickinson*, 331 U.S. 745, 751 (1947) (finding a taking although the plaintiff reclaimed most of the land that the government had flooded); *United States v. Cress*, 243 U.S. 316, 328 (1917) (a taking occurred where the erection of a lock and dam subjected the plaintiff's land to frequent overflows of water that were intermittent but recurring); *Ridge Line*, 346 F.3d at 1354-1355 (finding that there may be a taking although the property owner had constructed water detention facilities that abated the flooding); *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987) (finding a taking where flooding was remedied by the Corps after five years); *Barnes v. United States*, 538 F.2d 865, 869, 872 (Ct. Cl.1976) (finding a taking where a government dam caused parts of the plaintiff's land to be subject to additional intermittent flooding, reducing crop yields); *Eyherabide*, 345 F.2d at 607 ("The measure of plaintiffs' recovery is for the temporary taking (from 1954 through 1959)," when the plaintiff's land was

subject to intermittent physical invasions during that period.).

In turn, short duration floods have been held not to constitute a taking. *See, e.g., Hartwig v. United States*, 485 F.2d 615, 620 (Ct. Cl. 1973) ("The principle may be reduced to the simple expression: One flooding does not constitute a taking."). As another example, the flooding in *National By-Products, Inc. v. United States*, 405 F.2d 1256, 1257 (Ct. Cl. 1969), lasted for only two months, and the court held that the event did not rise to the level of a taking. Also, on facts where the flooding did not produce extensive or permanent damage, a taking did not occur, as in *Sanguinetti v. United States*, 264 U.S. 146, 149-50 (1924) ("Prior to the construction of the canal the land had been subject to the same periodical overflow. . . . If there was any permanent impairment of value, the extent of it does not appear. It was not shown that the overflow was the direct or necessary result of the structure; nor that it was within the contemplation of or reasonably to be anticipated by the Government.").

When the plaintiff actually benefitted from the government operation, no taking was found, as in *Fromme v. United States*, 412 F.2d 1192 (Ct. Cl. 1969), where construction of a channel caused two years of flooding that left part of the plaintiff's land in a boggy and weedy condition, a condition that was expected to disappear within two to three years. Citing evidence that the land had previously been subject to occasional flooding, and that the new channel was "very beneficial to the plaintiff in connection with the development of an extensive and valuable deposit of sand and gravel in her land," the court concluded that

"the evidence in the record fails to show a taking." *Id.* at 1194-97.

Precedent recognizes that the flood-induced destruction of timber is permanent injury, and is compensable within the meaning of the Fifth Amendment. On facts close to those herein, in *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987), during the five-year period in which the Corps of Engineers was conducting construction along a waterway, river blockage subjected Cooper's timbered land to standing flood water for prolonged periods during the spring and summer growing seasons, killing the timber. The court held that the United States had effected a taking, although the flooding was abated by the Corps after five years. *Id.* at 763-64 (citing *Armstrong v. United States*, 364 U.S. 40, 48 (1960); *Murray v. United States*, 817 F.2d 1580, 1583 (Fed. Cir. 1987) (destruction of a property interest is a compensable taking within the meaning of the Fifth Amendment)). The court in *Cooper* awarded compensation based on the value of the destroyed timber. *Id.* at 764.

Binding precedent directly contravenes the court's decision today. The floods in *Cooper* and the government activity that caused them were no less "inherently temporary," the words by which the majority characterizes the flooding, *see* maj. op. at 23, than the recurring flood releases here. In *Cooper* the flooding recurred each year, for as long as the river was clogged by the construction conducted by the Corps, just as the flooding here recurred each year, for as long as the Corps continued the improper release deviations.

Contrary to the court's holding today, no court has held that flooding damage is never compensable if the flooding is eventually stopped, whatever the injury. The decision in *Fromme* is misapplied by my colleagues, for *Fromme* illustrates the traditional balance that characterizes takings decisions, not a *per se* rule against taking if the flooding is eventually stopped. The Court of Federal Claims correctly held that: "The Supreme Court permits recovery based on temporary takings. . . . In effect, the temporary taking of a flowage easement resulted in a permanent taking of timber." 87 Fed. Cl. at 624. The trees that were killed did not revive. No error has been shown in the trial court's view of the facts and law.

My colleagues err in their analysis, incorrectly holding that the issue is solely whether the injurious flooding was eventually ended. My colleagues err in ruling that: "we do not focus on a structure and its consequence. Rather we must focus on whether the government flood control policy was a permanent or temporary policy." Maj. op. at 21. That view of the Fifth Amendment is incorrect. *See, e.g.*, *Owen v. United States*, 851 F.2d 1404, 1412 (Fed. Cir. 1988) (en banc) ("[I]t is not the location of the *cause* of the damage that is relevant, but the location and permanence of the *effect* of the government action causing the damage that is the proper focus of the taking analysis."). The question is not solely whether the Corps' departure from the flood control policy of the Water Control Manual was permanent or was abated after six years, but whether the increased flooding caused significant injury before the flooding was abated, such that, on balance, the Fifth Amendment requires just compensation.

The panel majority appears to acknowledge that "if particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim," maj. op. at 16, but then discards this possibility as a matter of law in concluding that "the deviations were by their very nature temporary and, therefore, cannot be 'inevitably recurring' or constitute the taking of a flowage easement." Maj. op. at 20. Thus the panel majority holds, contrary to law, that because the improper Arkansas flooding was not of permanent duration, there cannot be a taking despite the permanent flood damage. *See, e.g.*, *Navajo Nation v. United States*, 631 F.3d 1268, 1278 (Fed. Cir. 2011) ("Indeed, our precedent requires that temporary reversible takings must be analyzed in the same constitutional framework applied to permanent irreversible takings.") (quoting *Yuba Natural Res., Inc. v. United States*, 821 F.2d 638, 641 (Fed. Cir. 1987)); *Skip Kirchdorfer, Inc. v. United States*, 6 F.3d 1573, 1583 (Fed. Cir. 1993) (explaining that the "limited duration of [a] taking is relevant to the issue of what compensation is just, and not to the issue of whether a taking has occurred").

The findings of the Court of Federal Claims are not disputed by my colleagues as to the nature, cause, and amount of the damage to the Arkansas property. The determination that a compensable taking occurred is fully in conformity with precedent. My colleagues' ruling contradicts the entire body of precedent relating to the application of the Fifth Amendment to government-induced flooding. I respectfully dissent.

APPENDIX B

IN THE UNITED STATES COURT OF FEDERAL CLAIMS

No. 05-381L

[Filed: July 1, 2009]

ARKANSAS GAME AND FISH COMMISSION,	)
Plaintiff,	)
v.	)
UNITED STATES,	)
Defendant.	)

Post-trial decision on physical takings claim; superinduced additions of water to the Black River in Arkansas attributable to deviations by the Corps of Engineers from the operating plan for the Clearwater Dam in Missouri; periodic inundation of Dave Donaldson Black River Wildlife Management Area; loss of oak timber; just compensation

Julie D. Greathouse, Perkins & Trotter, PLLC, Little Rock, Arkansas, for plaintiff. With her at the trial and on the briefs were G. Alan Perkins, Perkins & Trotter, PLLC, Little Rock, Arkansas, and James F.

Goodhart, Arkansas Game & Fish Commission, Little Rock, Arkansas.

William J. Shapiro, Trial Attorney, Natural Resources Section, Environment and Natural Resources Division, United States Department of Justice, Sacramento, California, for defendant. With him at trial and on the briefs were Elizabeth Nicholas and Steven D. Bryant, Trial Attorneys, Natural Resources Section, United States Department of Justice, Washington, D.C. With him on the briefs was John C. Cruden, Acting Assistant Attorney General, Environment and Natural Resources Division, United States Department of Justice, Washington, D.C. Of counsel was Jennifer Dalton, United States Army Corps of Engineers, Little Rock, Arkansas.

OPINION AND ORDER

LETTOW, Judge.

This post-trial decision reprises the circumstances of a line of venerable precedents in the Supreme Court addressing situations where "superinduced additions of water" to rivers impaired the utility of adjacent lands and caused a taking. *Pumpelly v. Green Bay Co.*, 80 U.S. (13 Wall.) 166, 181 (1871) (Miller, J.) (holding that "where real estate is actually invaded by superinduced additions of water . . . so as to effectively destroy or impair its usefulness, it is a taking, within the meaning of the Constitution"); *see also United States v. Lynah*, 188 U.S. 445 (1903) (the government's construction of dams and other obstructions that raised the level of the Savannah River above its natural height and prevented drainage of a landowner's plantation was a taking requiring

compensation under the Fifth Amendment); *United States v. Welch*, 217 U.S. 333 (1910) (Holmes, J.) (holding that a taking arose where a landowner's property was flooded due to the government's dam); *United States v. Cress*, 243 U.S. 316 (1917) (determining that the government's construction and maintenance of locks and dams on the Cumberland and Kentucky Rivers created a backwater which resulted in a taking of a landowner's property); *United States v. Dickinson*, 331 U.S. 745 (1947) (finding a taking where the landowners' property was flooded due to the government's action in raising the level of a river); *United States v. Kansas City Life Ins. Co.*, 339 U.S. 799 (1950) (holding that a taking occurred where the government's action in raising the level of a stream for navigational purposes invaded a landowner's property by percolation of water, raising the water table, saturating the land, and blocking drainage so as to vitiate land's agricultural productivity).

The Arkansas Game & Fish Commission ("Commission") owns approximately 23,000 acres of land along the Black River in northeastern Arkansas that it manages as the Dave Donaldson Black River Wildlife Management Area ("Management Area"). The Commission in essence claims that during the years 1993-2000 the Corps of Engineers deviated from an operating plan for the Clearwater Dam upriver in southeastern Missouri, that these deviations caused greater amounts of water to flow down the Black River during the spring and summer growing seasons, that the increased water flows inundated the Wildlife Management Area for longer periods of time during the growing seasons, and that the sustained flooding and saturated ground during the growing seasons severely damaged the root systems of the oak species

prevalent in the Management Area, killing many trees. The government does not deny that the deviations occurred, but it contests any liability, arguing that the harm to timber was attributable to different and intervening causes, among other things. An eleven-day trial was held in Little Rock, Arkansas, commencing on December 1, 2008, and a site visit was made to the Management Area in connection with the trial. Following post-trial briefing, a closing argument was held on April 27, 2009, and the case is ready for disposition.

FACTS[1]

A. Dave Donaldson Black River Wildlife Management Area

The Management Area is a tract of approximately 23,000 acres, *see* PX 500 at 1 (Report of Dr. Mickey Heitmeyer, a wetland ecologist who testified on behalf of the Commission (June 2006)) ("Heitmeyer Report") located along both banks of the Black River in northeastern Arkansas, spanning parts of Clay, Greene, and Randolph counties. Stip. ¶ 4.[2] It extends

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[1] This recitation of facts constitutes the court's principal findings of fact in accord with Rule 52(a) of the Rules of the Court of Federal Claims. Other findings of fact and rulings on questions of mixed fact and law are set out in the analysis.

[2] The parties jointly stipulated to certain facts, and the Joint Stipulation will be cited as "Stip. ¶ __." Citations to the trial transcript are to "Tr. __" and those to the transcript of the closing argument are to "Cl. Tr.__." Plaintiff's exhibits are denoted as "PX __," defendant's exhibits are identified as "DX __," and joint exhibits are represented as "JX __."

from mile 142 to mile 100 of the Black River, *see* DX 310 at 3 (Expert Report of Dr. Wade L. Nutter, a hydrologist who testified on behalf of the government (Apr. 11, 2008)) ("Nutter Report"), and is situated roughly between the towns of Corning and Pocahontas. Tr. 39:5-7 (Test. of Robert L. Zachary, Wildlife Supervisor for the Arkansas Game & Fish Commission). Much of the land that constitutes the Black River Management Area was purchased by the Commission in the 1950s and 1960s to preserve bottomland hardwood and to provide wintering habitat for migratory waterfowl. PX 37 at AGFC350 (Information about Dave Donaldson/Black River Wildlife Management Area (Jan. 22, 2001)) ("Management Area Information"); *see also Arkansas Game & Fish Comm'n v. United States*, 74 Fed. Cl. 426, 428 (2006).[3] The Commission operates the Management Area as a wildlife and hunting preserve, placing special emphasis on the waterfowl that pass through the area in the late fall and early winter on the Mississippi River flyway. DX 310 at 3 (Nutter Report); Tr. 39:13-17 (Zachary) ("[B]ecause of its proximity to the Mississippi fly[]way and its importance to the waterfowl population in the fly[]way, as well as its importance to the public in terms of recreation, we place heavy emphasis on waterfowl management."). Secondarily, the Management Area serves as a timber resource, with systematic harvests of mature oak and subsequent reforestation to

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[3] The prior decision in this case addressed a dispute that arose during discovery regarding proposed installation of water gauges by government experts at various locations in the Management Area. *Arkansas Game & Fish Comm'n*, 74 Fed. Cl. at 427.

maintain a healthy regenerating forest. *See* PX 37 at AGFC352 (Management Area Information).

The forests in the Management Area are comprised of different hardwood timber species, but the dominant species are nuttall, overcup, and willow oaks, which comprise approximately eighty percent of the trees in the Management Area. PX 268 at AGFC7661B (Mem. from Lou Hausman, Forester, Arkansas Game & Fish Commission, Wildlife Management Division, to Zachary (Mar. 6, 1996)).[4] Bald cypress, tupelo, willow, green ash, and water hickory trees are found along the sloughs, together with, to a lesser extent, pin oak, water oak and cherrybark oak trees, dependent upon the soil composition. PX 37 at AGFC351 (Management Area Information); Tr. 1165:19 to 1166:6 (Hausman). The forests in and adjacent to the Management Area are "among the largest contiguous areas of [bottomland hardwood forest] in any floodplain in the Upper Mississippi Alluvial Valley." PX 500 at 5 (Heitmeyer Report).

A variety of wildlife habitats exist in the Management Area, *see* PX 500 at 5 (Heitmeyer Report), and the Commission's habitat coordinator inventories these habitats, develops biological prescriptions for the various compartments, and "optimize[s] those habitats on a sustainable basis." Tr. 47:1-6 (Zachary). The migrating bird flyway is a chief concern of the habitat coordinator and other members of the Commission. *See* PX 37 at AGFC350

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[4] Nuttall and willow oaks are classified as red oak species, and overcup oaks are classified as a white oak species. PX 268 at AGFC7661B (Mem. from Hausman to Zachary).

(Management Area Information). The Commission seeks, among other things, to manage the forests to provide food essential to the migrating birds' diet. *Id.* Of special concern are the oak trees in the Management Area, which provide hard mast for migratory birds and other wildlife. PX 268 at AGFC7661B (Mem. from Hausman to Zachary) (noting the importance of hardwood trees as contrasted to softwood trees for the reproduction of migratory and native wildlife); *see also* Tr. 613:20 to 614:1 (Test. of Martin Blaney, Statewide Habitat Coordinator for the Arkansas Game & Fish Commission) (describing the condition of the bottomland hardwood forest in the Management Area prior to 1993). In addition, the Commission maintains five diked Green Tree Reservoirs ("GTRs") in the Management Area: the Upper and Lower Island GTRs, the Upper and Lower Reyno GTRs, and the Winchester GTR. Tr. 66:4-7 (Zachary). Each year, the GTRs are artificially flooded to benefit wintering waterfowl and to provide recreational opportunities for waterfowl hunting. Tr. 65:24 to 66:3 (Zachary). Such management practices reflect the Management Area's importance as a premier duck hunting area. *See* PX 37 at AGFC350-51 (Management Area Information).

In July 1984, the Commission issued a Master Plan for the development and management of natural resources in the Management Area. Stip. ¶ 17; JX 23 at AGFC2576 to AGFC2976 (Master Plan for the Dave Donaldson/Black River Wildlife Management Area (July 12, 1984)) ("Master Plan"). Pursuant to the Master Plan, the Management Area was divided into fourteen compartments, or management units, such that the Commission could differentiate areas and engage in a variety of silvacultural and timber

management practices in different regions of the forest. Tr. 129:13-21 (Zachary); Stip. ¶ 18. This division of the forest into compartments reflected the Commission's "desire to have an uneven-aged diverse forest. . . . [T]he compartments would . . . be inventoried, and if needed, work would be prescribed as opposed to having no compartments and having to deal with the area as one whole unit." Tr. 129:16-21 (Zachary). The division into compartments thus "provide[d] direction and continuity for habitat management." Tr. 129:2-6 (Zachary).

The management practices employed by the Commission include selective thinning, clear-cutting, removal of undesirable species, and timber-stand improvement. Tr. 130:5-8 (Zachary). The Commission selectively harvests trees for commercial sales and "to stimulate the growth of new timber, to provide a diverse habitat type[,] and to remove unhealthy or unproductive trees from the forest." PX 37 at AGFC352 (Management Area Information). Thinning, for instance,

> produces competition between the older mature trees in the stand [and] . . . allows sunlight to penetrate the forest canopy, hit the forest floor. That stimulates the growth of the young trees and new seedling[s]. It also would stimulate the growth of desirable non-wooded plants within the forest. It would provide essential cover[] and food for various wildlife species.

Tr. 130:14-25 (Zachary). Timber surveys are periodically carried out in compartments in the Management Area to determine which tree species are present, to track the progression of growth, and to

analyze the basal structure of timber stands. Tr. 1174:10-19 (Hausman). After an inventory has been completed, the Commission's staff develops a set of prescriptions that summarize the inventory and recommend various management actions that should be undertaken to improve the relevant wildlife habitats, which can include the sale of timber. *See* Stip. ¶ 21.

B. Clearwater Dam

In southeastern Missouri, upstream from the Management Area and approximately 32 miles northwest of Poplar Bluff, Missouri, Clearwater Lake and Dam is located at mile 257 on the Black River. Stip. ¶¶ 7, 9. Construction on the Clearwater Dam began in 1940, two years after the passage of the Flood Control Act of 1938, Pub. L. No. 75-761, 52 Stat. 1215, 1218, which approved flood control projects for regions of the country that included the White River Basin in Missouri and Arkansas. DX285 at US783 (Water Control Manual for Clearwater Lake (July 1995)) ("Clearwater Lake Manual"); Stip. ¶ 8.[5] Construction of the dam was completed and the conservation pool was filled by autumn of 1948, at which point the Corps of Engineers began to control releases of water from the Clearwater Dam, regulating the flow of the Black River and reducing flooding of agricultural lands along the river. *See* DX285 at US783-84 (Clearwater Lake Manual). The Corps of Engineers is responsible for the operation of the Clearwater Lake and Dam as a flood control project. Stip. ¶ 3.

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[5] The Black River eventually flows into the White River near Jacksonport, Arkansas. Tr. 88:18-24 (Zachary).

In developing a plan to regulate the amount of water that should be released from Clearwater Lake into the Black River, the Corps of Engineers was attentive to differences in the agricultural season from April through November – which roughly corresponds to the growing season for bottomland hardwood trees – and the non-agricultural season from December through March. *See* DX285 at US784 (Clearwater Lake Manual). The Corps "timed and sized" the water releases from Clearwater Lake "such that [these] releases, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam," would not exceed certain predetermined target water stages at various gauges along the river. Stip. ¶ 13. Initially, in 1948, the Corps of Engineers regulated the flow of the river to ensure that the gauging station at Poplar Bluff would not exceed a level of twelve feet during the agricultural season from April through November, and fourteen feet during the remainder of the year. DX285 at US784 (Clearwater Lake Manual). Two years later, the Corps of Engineers adjusted the Poplar Bluff regulating stage to 10.5 feet during the agricultural season and 11.5 feet during the non-agricultural season. *Id.* The Clearwater Lake Water Control Manual was originally published in 1953 and later revised in July 1995. *See* Stip. ¶ 12; DX285 at US764 (Clearwater Lake Manual). The Manual notes that "[t]he primary purpose of Clearwater Dam is to provide flood protection below the dam and to maintain a permanent conservation pool for recreation, fish and wildlife, and other incidental uses." DX285 at US817 (Clearwater Lake Manual).

The modified water control plan implemented in 1950 for Clearwater Lake was still in effect in 1993, at

which point the Corps of Engineers implemented a series of deviations from the plan regarding water releases from Clearwater Dam. *See* Stip. ¶ 15. The deviations entailed new water-level targets at the Poplar Bluff gauge. *Id.* These deviations were approved at various times from 1993 to 2000, typically on an interim basis. *Id.*; *see* PX 266 at AGFC7657 (Mem. from Zachary to Don Akers, Chief of Arkansas Game & Fish Commission, Wildlife Management Division (Feb. 22, 1996)).[6] The interim deviations initially permitted releases from Clearwater Lake such that the Poplar Bluff gauge would measure 10.5 feet during the winter and early spring, eight feet from April 15 to May 15, and six feet from May 15 to November 15. PX 268 at AGFC6771 (Mem. from Hausman to Zachary). These interim deviations were modified at various times in the late 1990s; for instance, in 1999 and 2000, the water level at Poplar Bluff was set at a level of 11.5 feet from December to mid-May and at four feet from mid-May to November. *See* JX 14 at AGFC272 (Draft Environmental Assessment for Revision of Clearwater Lake Black River Water Control Manual (Sept. 1999)) ("Clearwater Lake Environmental Assessment"); DX 310 at Table 1 (Nutter Report) (listing the implemented deviations to the water control plan from 1993 to 2000); Tr. 208:4-8 (Test. of Roger Chris Hicklin, Chief of the Planning and Environmental Office of the Corps of Engineers).

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[6] As a news release issued by the Corps in 2001 stated, "[f]or years, farmers who plant low-lying acreage downstream of Clearwater Dam sought and were granted numerous deviations from the water control plan." PX 575 at US33 (Corps' News Release (Apr. 9, 2001)).

Numerous interest groups were concerned with these modifications to the 1950 water control plan, including the Commission, the Corps of Engineers, the United States Fish and Wildlife Service, the Missouri Conservation Department, dock owners and campsite operators at Clearwater Lake, and drainage district members. *See* Tr. 81:13 to 82:2 (Zachary); PX 266 at AGFC7657 (Mem. from Zachary to Akers). At various times, these groups participated in the White River Reauthorization Ad Hoc Work Group, and later in a spinoff of that group termed the Black River subcommittee. Tr. 81:2-8 (Zachary). This subcommittee was moderated by Gary Cristoff, a representative from the Missouri Department of Conservation. Tr. 104:13-16 (Zachary).

At the subcommittee's meetings and at meetings of the White River group during the mid-1990s, employees of the Commission raised numerous objections to the Corps of Engineers' alterations of the water control plan. *See, e.g.*, Tr. 83:24 to 84:7 (Zachary); PX 266 at AGFC7657-58 (Mem. from Zachary to Akers). In particular, the Commission's staff noted that the Management Area had begun to experience flooding during the growing season; they ascribed this type of flooding to the Corps of Engineers' interim deviations from the water control plan. *See* Tr. 83:15 to 84:7 (Zachary); PX 268 at AGFC7661 (Mem. from Hausman to Zachary). The Commission was concerned with the effect that higher river levels would have on "bottomland hardwood resources on Black River" near the Corning gauge. Tr. 84:4-7 (Zachary). The Commission's baseline argument was that the river level must be "no higher than 6 feet" at the Corning gauge and under 4.5 feet at other lower elevations, such as the Poplar Bluff gauge, to

sufficiently dewater the GTRs in the Management Area during the growing season. PX 266 at AGFC7657 (Mem. from Zachary to Akers). In early 1996, the Commission pointed out that the previous year's heightened river level, in combination with above-normal rainfall, had "prevented drainage of the [Management Area]" and had been "detrimental to the water intolerant oak tree species over thousands of acres." *Id.* at AGFC7658. The Commission was concerned with the effects of "a much longer duration of stagnant water being held on the biologically and economically valuable hard mast bearing species of trees." PX 268 at AGFC7661B (Mem. from Hausman to Zachary).

At various times, members of the Commission attempted to persuade the Corps of Engineers to return to the original water control plan, which the Commission argued would more promptly evacuate water from the Management Area. *See* PX 268 at AGFC7661B (Mem. from Hausman to Zachary); PX 270 at AGFC7664 (Mem. from Zachary to Akers and Mike Armstrong, Assistant Chief, Fisheries Division) (Apr. 5, 1996)) (noting that the original plan would "permit[] the earlier passage of stored flood water within Clearwater Lake and consequently reach[] a level of 6 [feet] or less at Corning, at an[] earlier date, thus enabling drainage of [the Management Area] at a much earlier date"). However, the Black River subcommittee was never able to reach a consensus on an acceptable alternative plan, and the interim deviations from the authorized water control plan continued through the late 1990s. *See* Tr. 84:8-12 (Zachary); Stip. ¶ 15.

The Corps then considered adopting a permanent revision to the water control plan that would "modify the stages on the Black River at Poplar Bluff, Missouri to which flood control releases from Clearwater Dam would be regulated." JX 14 at AGFC268 (Clearwater Lake Environmental Assessment); Tr. 80:17-22 (Zachary). This revision, if adopted, would have kept the target river stage at Poplar Bluff from December through mid-May at 11.5 feet, but would have set the target stage from mid-May to November at 4, 6, 8, or 10.5 feet, depending on the water elevation at Clearwater Lake. JX 14 at AGFC268 (Clearwater Lake Environmental Assessment). Contrary to the Commission's representations to the Black River subcommittee, the Corps of Engineers did not contemplate that its deviations, as implemented in the 1990s or as proposed, would have much of an effect in the portion of the river located downstream in Arkansas. *See id.* In a draft version of the environmental assessment performed to evaluate these revisions, the Corps of Engineers found that "[t]he effect of Clearwater Dam diminishes at approximately the Missouri/Arkansas state line . . . due to the increased size of the watershed." *Id.* The draft environmental assessment summed the Corps of Engineers' results of its research into the effects of the proposed revisions to the initial water control plan as a "FINDING OF NO SIGNIFICANT IMPACT." *Id.*

Following a meeting held in Jonesboro, Arkansas, on August 18, 1999, both the Commission and the United States Fish and Wildlife Service raised objections and comments to the proposed permanent revision and to the Corps of Engineers' finding of no significant impact. *See* Tr. 527:15-19 (Test. of Robert Leonard, River Basins and Government Organizations

Division of the Arkansas Game & Fish Commission); PX 66 at AGFC866 (Mem. from Field Supervisor, Arkansas Field Office of the Fish and Wildlife Service, to Field Supervisor, Columbia Field Office (Nov. 1, 1999)); PX 67 at AGFC872 (Letter from Leonard to Jim Ellis, Corps of Engineers (Oct. 23, 1999)). The Fish and Wildlife Service maintained that the Corps of Engineers had provided insufficient drainage data to support its contention that the effect of releases from Clearwater Lake diminished beyond the Missouri-Arkansas state line. PX 66 at AGFC867 (Mem. from Field Supervisor, Fish and Wildlife Service). In recommending that the Corps return to the authorized water control plan pending further study in the White River basin, the Fish and Wildlife Service cited the potential for damage to the floodplain forest in the Management Area, which it described as a "valuable resource." *Id.* at AGFC870. Separately, the Commission reiterated that it had "significant problems" with the new plan for water releases. PX 67 at AGFC872 (Letter from Leonard to Ellis). As the Corps of Engineers weighed these arguments, it continued to implement interim deviations from the water control plan through November 2000. *See* DX 310 at Table 1 (Nutter Report).

C. Tree Mortality and Injury

1. Mortality and injury developed gradually.

Tree mortality and injury in the Management Area developed gradually in the late 1990s. *See* Tr. 64:9-18

(Zachary).[7] Shortly after the initiation of the deviations to the water control plan, in August 1994, Martin Blaney visited parts of the bottomland hardwood forest in the Management Area and observed that these areas were "intact forests." Tr. 628:23 to 629:5 (Blaney). Yet some injury to trees in the Management Area may have been occurring by this time, as Mr. Zachary reports that he "began to see some signs of stress beginning about 1993 when [the Commission] began to notice that we were experiencing flooding of the area during the growing season." Tr. 61:9-12 (Zachary). Mr. Hausman reports that in the period between 1993 and 1999, some parts of the forests were beginning to exhibit signs of stress: in particular, certain inundated nuttall oak trees were "starting to lose a few leaves from the tips, from the ends of the twigs." Tr. 1237:17-23 (Hausman). By the early part of the growing season in 1999, the Commission noticed evidence of increased mortality and water stress of the nuttall oaks in the Management Area, including tip die-back and swelling of the trees' basal areas. PX 500 at 30 (Heitmeyer Report). Then, in July 1999, Mr. Hausman observed many trees with brown leaves, and reported to Mr.

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[7] Photographs of the bottomland forest provide graphic evidence of the mortality and injury to the dominant oak species that occurred during the period of the deviations. PX 562 consists of aerial photographs taken by the Arkansas State Highway Department in 1983 and 1986, *see* Tr. 1194:2 to 1198:18, 1202:18 to 1203:15 (Hausman), that show a full unbroken canopy of trees extending throughout the Management Area, excepting only Lake Ashbaugh, the Black River, and roads and dikes. By contrast, PX 53 is a set of photographs taken in April 2000, showing the results of the "big brown out in 1999." Tr. 1271:25 (Hausman). Those photographs, particularly PX53-A, C, D, E, F, I, and N, show substantial areas of dead trees and debris from fallen dead trunks.

Zachary evidence of a large brownout of dead or dying trees in the area of Schaeffer's Eddy and Gar Slough, and on the GTR impoundments. Tr. 1240:12-20 (Hausman); PX 90 (Mem. from Hausman to Zachary (July 29, 1999)). Upon receiving this report of a "dramatic change in the forest's health over a large portion of the area where [the Commission] had previously been concerned about flooding," Mr. Zachary toured the forest and observed several thousand acres over which this tree mortality and decline had occurred. Tr. 61:21 to 62:23 (Zachary). Mr. Blaney, too, testified that when he visited the Management Area in 1999, he observed "a massive die-off of oak timber" that was "a stark contrast from the healthy forest that [he had] seen before." Tr. 612:2-17 (Blaney).

Mr. Zachary ascribed this damage to "stress caused by water, stagnant water being in the area during the growing season for consecutive years beginning in '93 that led to a decline, gradual decline, and then finally a drastic change due to conditions in 1999." Tr. 64:14-19 (Zachary). He noted that with respect to the flooding during the late 1990s, "the water stayed in the management area during the growing season whereas natural flooding would tend to -- you would see a sudden rise and then water would drain from the area as soon as the river went back down to within [the] bank." Tr. 72:18-25 (Zachary). When the water did not drain from the Management Area, under Mr. Zachary's characterization, the river would be "h[e]ld[] . . . at an artificially high level during the growing season, causing inundation to a lot of . . . nuttall/overcup oak sites on the wildlife area." Tr. 1234:3-6 (Hausman).

2. Water-stage testing.

To determine the cause of the widespread tree mortality and injury, and to analyze the effects of the new water control plan proposed in the 1999 draft environmental assessment, the Corps of Engineers, working with the Commission, engaged in water-stage testing in 2000 and 2001. JX 5 at AGFC116 (Mem. from Hausman to Zachary (June 5, 2000)); Tr. 1254:15-25 (Hausman); PX 575 at US34 (Corps' News Release). The goal of the first test, performed on May 22-25, 2000, was to release sufficient water from Clearwater Lake to reach a six-foot level at the Corning gauge, and to observe what effects this level would have in the Management Area. JX 5 at AGFC116 (Mem. from Hausman to Zachary); Tr. 1255:1-10 (Hausman). However, due to drought conditions, there was not enough water in the lake at the time to reach the desired level, and instead the water level crested at 4.7 feet on May 22. *See* Tr. 1255:1-16 (Hausman); JX 5 at AGFC116 (Mem. from Hausman to Zachary). Even with this lower-than-planned water level, some water began to enter the Upper Island area and flood the GTR at that location. JX 5 at AGFC116 (Mem. from Hausman to Zachary). Members of the Corps' staff, however, doubted that this incomplete test result was indicative of flooding of the Management Area and damage to the oak stands. Mr. Mike Hendricks, the local Chief of Reservoir Control for the Corps, opined that "AG&FC's claims that this plan [to make the deviations permanent] will destroy the hardwoods is, in my opinion, unfounded." JX 187 at US00570 (E-mail from Hendricks to Michael Miller (Feb. 26, 2001)). Nonetheless, Mr. Hendricks and the Commission's staff had agreed to conduct further testing: "if water was on the hardwoods on a

certain date [in the Spring of 2001] and [the Corps] still had flood storage to evacuate, we would provide reduced release for 4 to 5 days to allow the water to drain, then we would increase releases for 4 or 5 days." *Id.*

The additional testing and site visit to the Management Area was conducted on March 19-20, 2001, this time after sufficient water had been released from Clearwater Lake to attain a level of six feet at the Corning gauge from March 13-19, 2001. PX 76 at AGFC1167 (Corps of Engineers' Briefing on Black River Water Control Issue with Arkansas Game & Fish Commission)) ("Corps' Briefing"); Tr. 760:24 to 761:5 (Blaney). Under these conditions, personnel from the Corps of Engineers were able to "confirm that significant amounts of tree roots were flooded and could, under certain conditions, remain flooded long enough to damage or destroy the trees at the regulating stages under the new plan." PX 575 at US34 (Corps' News Release); *see also* PX 76 at AGFC1183 (Corps' Briefing) (finding that the observed six-foot stages were "negatively impacting [the Management Area] during [the] growing season"). Mr. Hicklin and Mr. Glen Raible, Senior Hydraulic Engineer in the Hydrology and Hydraulics Section of the Corps of Engineers, were present during the site visit, and found that the river was about one foot below the top bank in most of the areas visited. PX 637 at US545 (E-mail from Raible to Hendricks (Mar. 21, 2001)); Tr. 228:4-11 (Hicklin). However, in other parts of the surveyed area, water was overtopping the levees and flooding parts of the forest. PX 637 at US545 (E-mail from Raible to Hendricks). Based upon this evidence, the Corps of Engineers determined that the four-foot stage called for in the new plan would

"inundate[] the roots of the hardwood trees in the wildlife management area." PX 575 at US35 (Corps' News Release). Accordingly, Colonel Tom Holden, the district engineer for the Corps, concluded that the deviations recommended in the proposed growing season plan "would unacceptably extend the duration of water inundation on bottomland hardwoods" in the Management Area. PX 576 at US38 (Colonel Holden's Remarks to the Black River Operations Public Meetings (Apr. 25-26, 2001)).

3. Cessation of deviations.

In April 2001, the Corps of Engineers ceased all deviations from the 1950 water control plan and returned to the releases specified in that original plan. *See* PX 575 at US33 (Corps' News Release). In describing why it was abandoning the plan proposed in its earlier environmental assessment, the Corps stated its concern for "potential for damage to bottomland hardwoods in the Dave Donaldson Black River Wildlife Management Area." *Id.* The Corps noted that because the alternative water control plan endorsed in the draft environmental assessment "could cause significant changes to the environment of the wildlife management area, the National Environmental Policy Act blocks its implementation unless an Environmental Impact Statement is prepared to ensure adequate environmental safeguards are put in place." *Id.* at US34. These statements reflected the conclusions reached in the Corps of Engineers' final environmental assessment, in which the Corps reported that the earlier finding of no significant impact could not be supported. PX 76 at AGFC1166 (Corps' Briefing).

4. Water-gauge data.

Both prior to and after the dispute over growing-season inundation arose, the Commission used water gauges at various locations in the Management Area to monitor water depths, analyze which areas were covered by water, and determine the river levels at which nuttall and cherry bark oak tree communities would become inundated. Tr. 77:21 to 78:7, 78:20-25 (Zachary). Water gauges are located in each of the GTRs, and at the Brookings and Hubbell Bridge access points. Tr. 74:7-14 (Zachary). The Brookings and Hubbell gauges were installed in 1994, Tr. 78:10-11 (Zachary), and the other reservoir gauges were established in 2004. Tr. 1385:6-8, 1388:10-12 (Hausman).[8] Other gauges previously had been installed and maintained by the United States Geological Survey, with a gauge at Corning having been established in 1939, PX 500 at 12 (Heitmeyer Report), and another at Poplar Bluff having been in use since at least 1980. *See* JX 20 at AGFC2169 (ATOKA Draft Review of Available Data and Recommendations (Apr. 20, 2001)).

In addition, the government caused its experts to install eleven water-level recorders at various locations in the Management Area in November 2006, and they

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[8] In 2001, the Commission had commissioned a study to develop recommendations for installation of water gauges and piezometers in the Management Area, *see* Tr. 763:25 to 769:3 (Blaney); JX 17 (Work Plan and Cost Estimates for Staff Gauge and Piezometer Installations, prepared by ATOKA, Inc. (June 2001)), but the Commission was unsuccessful in obtaining funding for the installation, either from the Corps or from its own resources. Tr. 769:2 to 770:1 (Blaney).

remained in place throughout the 2007 growing season. *See Arkansas Game & Fish Comm'n*, 74 Fed. Cl. at 434 (concluding that the Commission had "to permit the government's experts to install seven to ten piezometers"); DX 310 at 19 & Figure 21 (Nutter Report) (depicting eleven piezometers). The recorders were set to measure water levels twice a day, at 7:00 a.m. and 7:00 p.m., and to store those data pending removal of the device and transfer of the information. Tr. 3091:22 to 3093:13 (Nutter). Roughly eleven months of water level data were obtained, commencing in November 2006. Tr. 3092:25 to 3093:4 (Nutter).

The parties focused on hydrological data obtained particularly from the water-gauge station in Corning to analyze dynamics in the water levels of the Black River in the Management Area. *See* PX 507 at 2 (Supplemental Report of Dr. Heitmeyer (May 7, 2008)); DX 310 at 14, 26-27 & Figures 22-26 (Nutter Report). The Corning gauge is the closest river gauge upstream of the Management Area. Tr. 2785:23-25 (Heitmeyer). Actual gauge readings of the stage-levels at the Corning gauge were available starting in December 1973, *see* JX 266 (Corning Gauge Data from 1973 to 2008), and daily discharge levels from Clearwater Lake, which became available starting in 1939, can be used to correlate Corning stage levels prior to 1973. PX 507 at 2 (Supplemental Report of Dr. Heitmeyer); Tr. 2783:9-19 (Heitmeyer) (explaining the process by which discharge levels are extrapolated to river stage levels).

In describing historical, unmanaged flooding patterns in the Management Area, Dr. Heitmeyer testified that there was typically "increased overbank flooding and runoff some time in late fall, early winter"

and that this "flooding would continue on a periodic dynamic basis throughout some time in spring, late spring, occasionally into early summer." Tr. 2773:12-17 (Heitmeyer). He emphasized the seasonal dynamic of the floods, stating that the Management Area "[w]ould dry out during the summertime period, and into early fall, and then start to reflood, or reincrease precipitation again that coming fall." Tr. 2773:17-20 (Heitmeyer); PX 500 at 11-13 (Heitmeyer Report) ("Seasonal flooding is a dominant feature of the hydrology that controls the habitat community structure of the Black River floodplain in the [Management Area] region.").

By contrast, an analysis of the water-gauge data from 1993 to 1999 reveals that the Black River was above five feet at the Corning gauge for an average of 97.43 days during each year's growing season, April 4 through October 11, and above a level of six feet at the Corning gauge for an average of 91.14 days each growing season. PX 500 at 13 (Heitmeyer Report) (Table 3); *see* JX 266 (Corning Gauge Data). When compared with the historical data for the Corning gauge during the growing seasons from 1949 to 1992, the period from 1993 to 1999 reflects an average annual increase of 26.44 days at which the gauge exceeded five feet during the growing season, and an increase of 28.98 days at which the gauge exceeded six feet during the growing season. PX 500 at 13 (Heitmeyer Report) (Table 3); Tr. 2823:18-21 (Heitmeyer).[9]

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[9] Levels above five feet at Corning during the growing season averaged 54.30 days from 1939-48, 68.45 days from 1949-92, and 58.80 days from 2000-04. PX 500 at 13 (Heitmeyer Report) (Table

In addition, from 1993 to 1998, the water level at the Corning gauge exceeded five feet for at least 65 days during every year's growing season, ranging from 65 days in 1993 up to 166 days in 1997. PX 500 at 14 (Heitmeyer Report) (figure 10); JX 266 (Corning Gauge Data).[10] In no prior six-year time span had the water level at the Corning gauge exceeded five feet for that many days in each growing season. Tr. 2781:17-20 (Heitmeyer). In his report, Dr. Heitmeyer stated that when the Black River was at a level of five feet, as measured at the Corning gauge, surface water would inundate more than thirty percent of the nuttall oaks in the Management Area, and at a level of six feet, more than fifty percent of the nuttall oaks would be inundated. PX 500 at 30 (Heitmeyer Report).

Dr. Overton, an expert in hydrology and hydrogeology, who testified on behalf of the Commission, also compared the number of days the Black River had reached certain river level ranges from 1981 to 1992 with the number of days it reached those ranges from 1993 to 1999. *See* PX 506 at Figure 3 (Report of Dr. Jerry Overton (May 7, 2008)) ("Overton Report"). This comparison indicated that the river level at Corning reached and sustained elevated levels during the deviation period compared to prior, non-deviation years. *See id.* The Corning

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3). Levels above six feet at Corning during the growing season averaged 50.60 days from 1939-48, 64.70 days from 1949-92, and 55.60 days from 2000-04. *Id.*

[10] 1999 and 2000 were years of moderate drought, in which a level of five feet was exceeded at Corning only 22 days in 1999 and 19 days in 2000. PX 500 at 14 (Heitmeyer Report) (figure 10); JX 266 (Corning Gauge Data).

gauge registered a range of five to six feet, at which levels parts of the Management Area would be inundated, an average of 19.91 days during the April-to-October growing season from 1981 to 1992, whereas it was in that range for an average of 12.58 days for the April-to-October growing seasons from 1993 to 1999. PX 506 at Table 2 (Overton Report). From 1981 to 1992, the Corning gauge reached a range of six to eight feet an average of 30.16 days during the growing seasons and 30.72 days from 1993 to 1999, an insignificant difference. *Id.* However, significantly, it reached eight to 10.5 feet for an average of 24.58 days during the growing seasons from 1981 to 1992, and 46.58 days from 1993 to 1999. *Id.* Finally, the gauge at Corning reached a range of 10.5 to 11.5 feet for an average of 17.26 days during the growing seasons from 1981 to 1992, and 16.14 days from 1993 to 1999, also an insignificant difference. *Id.*

In addition, the government also made use of a computerized modeling system to simulate the flows of the Black River based on reservoir operating data. Tr. 2927:21 to 2928:14 (Raible). The hydrological model was a "feedback model," DX 310 at 15 (Nutter Report), which relied upon three different inputs: first, the volume of the reservoir, in this case, Clearwater Lake, and the releases it makes; second, "a downstream regulating control point that sets the limits on the amount of flow that [the] reservoir can release," in this instance at Poplar Bluff; and finally, any "intervening flows" in the river, which consist of the tributaries that enter the river downstream of the reservoir but before Poplar Bluff. Tr. 2931:8 to 2932:12 (Raible). The Corps used its modeling system to determine the expected flows of the river at various downstream control points, including the Corning gauge, based on

the reservoir operations at Clearwater Lake from 1993 to 2000. *See* Tr. 2932:20 to 2933:16 (Raible); DX 310 at 16-17 (Nutter Report). The model was run both with and without the Corps' deviations from the authorized water control plan. DX 310 at 16 (Nutter Report). From the results of this modeling, the Corps concluded that even without the deviations from the authorized water control plan, there would have been significant periods of timber stress and inundation, particularly from 1994 to 1996. Tr. 3358:4-12 (Test. of Dr. Sammy L. King, an expert in wetlands and forest ecology and management, who testified on behalf of the government). In all, the modeling predicted that there would have been flooding in the Management Area for 72.8% of the days during the growing seasons from 1994 to 1999. Tr. 3361:12-18 (King).

5. The Commission's timber surveys.

After receiving Mr. Hausman's report addressing damage in the Management Area in 1999, the Commission approached Kingwood Forestry Services, a timber consultant, and asked for a resource appraisal and evaluation and an inventory of damages on the affected areas. Tr. 753:2-6 (Blaney). In October to December 2000, employees of Kingwood Forestry Services, including Dr. James Baker, James Foster, and Phillip Livingston, performed a survey and timber inventory of several compartments in the Management Area, covering a total of 6,990 acres of forested land, or approximately five percent of the Little River GTR, Reyno GTR, and Winchester GTR, as well as the Gar Slough and Schaeffer's Eddy areas. PX 80 at 1-8 (Resource Evaluation and Damage Appraisal by Kingwood Forestry Services (Jan. 2001)) ("Kingwood Report I"); Tr. 753:12-18, 755:14-22 (Blaney). Dr.

Baker performed field studies in five different sections of the Management Area, plus two control areas at slightly higher elevations where no damage was expected, measuring mortality and injury rates in the seven areas. PX 80 at 1, 7 (Kingwood Report I). In addition, he reviewed the Commission's hydrology and timber-stand records to determine the potential causes of mortality in the Management Area. *Id.* at 1.[11] As a final task, Dr. Baker and Kingwood sought to appraise any losses in terms of the economic value of timber and land value in the Management Area. *Id.* at 2.

Oak trees exhibit various responses to stress, including epicormic branching, where branches form "underneath the bark in the sapwood;" stag heading and dieback in the crown where branches or "whole segments of the crown" die; and phloem necrosis "where the bark of a tree begins to die" and loosen and fungal growth appears on the branches or main stem of the tree. Tr. 2077:1-25 (Foster). In addition, if a tree contains lesions or is leaking sap, it is generally considered to be stressed. *See* Tr. 1956:7-15 (Livingston). Kingwood Forestry Services classified a tree as "declining," when it was exhibiting one or more

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[11] The government criticized the Kingwood Timber Survey in 2000 and a later survey conducted in 2001 on the grounds that the cruise maps for the surveys were not preserved and the results were not audited. Def.'s Post-Trial Br. at 59. However, testimony at trial covered in considerable detail the methodology, instructions, and directional orientation of each of the cruises. Tr. 1942:12 to 1946:18, 1948:13 to 1964:18 (Livingston). The persons conducting the cruise survey were registered foresters, and they followed protocols and instructions that comported with accepted forestry practices. Tr. 1964:5-13 (Livingston). The government's critique is not well founded.

of these symptoms, although it was also required to be sufficiently alive to have at least one green leaf. *See* Tr. 2076:13-16 (Foster); Tr. 1956:15-19 (Livingston). If the tree lacked any green leaves, it was considered to be dead. Tr. 1956:5-6 (Livingston).

In the areas sampled, Kingwood calculated that the mortality rate for red oaks, primarily nuttall oaks, was 15% in the Little River Island GTR, 32.8% in the Reyno GTR, 8.9% in the Winchester GTR, 12.3% in Gar Slough, and 58.6% in Schaeffer's Eddy. PX 485 at AGFC11549 (Kingwood Report of Hardwoods in Black River Wildlife Management Area (Oct. 2000)).[12] Given that a tree was determined to be dead if it had died within the past three years, Tr. 2075:20-23 (Foster), the approximate annual mortality rate in these areas was calculated by dividing the above percentages by three. Additionally, Kingwood reported that thirty to forty percent of the red oaks in the GTRs were in a declining state, demonstrating signs of "severe die-back in their crowns" or other symptoms of decline in health and vigor, along with ten to fifteen percent of the red oaks in Gar Slough and Schaeffer's Eddy. PX 80 at 7 (Kingwood Report I); PX 485 at AGFC11549 (Kingwood Report of Hardwoods in Black River Wildlife Management Area); Tr. 2076:13-16 (Foster). Of the trees in the sampled areas that were dead or declining, Kingwood found evidence in their increment cores of "dead cambium and decaying sapwood," which

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[12] Some of the data that Kingwood used to extrapolate to these and other measures of injury and mortality was characterized by a high statistical confidence interval, due to both the relatively small sample size of particular species of trees in some sample areas and the "irregular, scattered pattern of [dead] trees through the woods." Tr. 2217:2-8 (Foster); Tr. 2218:24 to 2219:1 (Foster).

Kingwood described as "unusual for oaks, since they normally decay from the pith outward as a result of internal pathogens." PX 80 at 8 (Kingwood Report I). A darkening of the cambium layer was indicative of anaerobic activity and general tree decline. Tr. 2386:13-19 (Baker). Mr. Foster estimated that approximately half of the declining trees would die, and that the other half would "live out . . . a normal lifespan in a degraded, devalued condition." Tr. 2226:5-11 (Foster). By contrast, of the ten thousand red oaks analyzed in the two control areas, no trees were dead and only 150 trees were in a declining state. PX 485 at AGFC11549 (Kingwood Report of Hardwoods in Black River Wildlife Management Area).

Based on this first examination, Dr. Baker described the affected parts of the Management Area as "a bottom[]land hardwood ecosystem in a state of collapse. Most of the nuttall oak, most of the red oaks were dead or dying. Many of the white oaks were dead or dying. Most of the sweetgum were dead or dying." Tr. 2400:2-6 (Baker). Dr. Baker characterized the change in the ecosystem as a transition from a "riverine, bottom[]land hardwood community" towards a "headwater swamp" condition. Tr. 2400:11-16 (Baker).

In seeking to explain the "rapid degradation of the oak dominated forests," Kingwood proffered three possible explanations: first, that the oak stands had reached maturity and were simply dying of old age, second, that the bottomland hardwood forests in the Management Area were suffering from a more general decline common to many GTRs in the southern United States, and third, that a change in soil or site conditions had resulted in timber-stand degradation.

PX 80 at 8 (Kingwood Report I). In rejecting the first explanation, Kingwood noted that many young trees in the affected areas were dying and older trees on sites not flooded during the growing season were still healthy. *Id.* at 9. Kingwood rejected the second possible explanation on a similar ground – trees were undergoing excessive mortality only on the sites that were flooded during the growing season, regardless of whether or not those sites were GTRs. *Id.* Kingwood settled on the third possible explanation, ascribing the "rapid degradation . . . of the oak stands . . . to the 1993 change in the water control plan for Clearwater Lake and the Black River." *Id.* Kingwood noted that the Corps' deviations from the authorized water control plan "subjected the oak forest communities in the [Management Area], and possibly elsewhere along the river, to abnormal and extended flooding and saturated soils during much of the growing season for five consecutive years." *Id.* Kingwood concluded that

> [e]ven though the oak forests that exist in the Black River flood plain are tolerant of dormant season flooding and wet soils, they cannot tolerate repeated growing season floods and saturated soils. The prolonged growing season flooding (June – August) that occurred in 1994-1998 undoubtedly resulted in saturated soils, inadequate oxygen levels in the water and the soil, increased root respiration, and significant root mortality and die-back in many of the less water tolerant trees such as [n]uttall oak and sweetgum.

Id. Kingwood appraised the losses of dead and declining timber from excessive mortality in this study area at $4,516,000. *Id.* at 19; PX 505 at 3 (Supplement

to Kingwood Report I (May 8, 2008)) (adjusting appraised value in first report to account for background mortality rate); Tr. 2244:2-13 (Foster).

Kingwood performed a second study in the summer of 2001, examining approximately 5,776 additional acres of bottomland hardwood forest in the Management Area that had not been analyzed in the first study. PX 79 at 4 (Resource Evaluation and Damage Appraisal by Kingwood Forestry Services (Dec. 2001)) ("Kingwood Report II"); *see* Tr. 1981:17 to 1983:9 (Livingston). Of the approximately 15,935 acres that had not been examined during the first study, Kingwood used aerial photography and verification on the ground to determine that 4,302 of those acres had "little or no timber damage" above the typical annual background mortality rate of 0.5%. PX 79 at 4 (Kingwood Report II); *see* Tr. 1983:17 to 1984:20 (Livingston) ("We did what we call ground-truthing to verify the areas that we thought to have no mortality or low mortality . . . and the areas that were thought to have mortality . . . ."). Kingwood selected 5,776 acres to be examined in its second study to be representative of the entire remaining 11,633 acres that comprised the secondary damage area. PX 79 at 4 (Kingwood Report II). During this study, Kingwood again found levels of mortality in the affected regions of the Management Area that were greater than those levels found in the control areas or those levels typically found in bottomland hardwood forests. Tr. 2428:10 to 2429:1 (Baker). The mortality levels in the additional area were lower than those measured in Kingwood's first study, but the appearance of the mortality in the two areas studied was "very similar." Tr. 2395:6-14 (Baker). Dr. Baker found that "there was excessive or elevated mortality

in the Part 2 study area on an order of magnitude of about one-fourth in value per acre." Tr. 2240:19-25 (Baker). Kingwood completed its study in December 2001 and determined that the value of the economic damages related to the timber loss in this secondary area was $1,961,000. PX 79 at 15 (Kingwood Report II).

In earlier years prior to timber harvests, the Commission had also caused surveys to be performed. *See* Tr. 1175:3-10 (Hausman). Even during 1993 through 2000, which was the period of deviations from the operating plan at Clearwater Dam, the Commission continued to perform, albeit in a narrower summer window of time, "forestry work like timber inventories [and] timber markings for timber sale activities." Tr. 1236:18 to 1237:5 (Hausman).[13] These timber inventories, performed approximately every ten years on each compartment, were either provided by contractors with the Commission or by the staff of the Arkansas Forestry Commission. Tr. 1174:23 to 1175:11 (Hausman).

6. The government's surveys.

On the same five affected sections and two control sections of the Management Area analyzed by Kingwood, the government performed a different type of survey, collecting and analyzing tree cores from nuttall and overcup oak trees within various fifty-acre clusters in those sections. Tr. 3187:17 to 3188:13

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[13] The Commission had adopted the practice of conducting logging operations in the Management Area from July 1 to September 30. *See* Tr. 1188:17-22 (Hausman).

(Test. of Wayne Williams, Second Vice President and Forest Management Operations Coordinator, Sizemore & Sizemore).[14] A total of 62,000 tree cores were collected over the course of the survey. Tr. 3252:1-2 (Test. of Dr. Henry Grissino-Mayer, a dendrochronologist who testified on behalf of the government). Dr. Grissino-Mayer analyzed the width and density of the rings within the cores and compared the density of the "early wood" portions of each ring, which are formed "early in the growing season," with the density of the "late wood" portions, which are formed late in the growing season. Tr. 3230:7-12, 3251:14-19 (Grissino-Mayer). The purpose of Dr. Grissino-Mayer's analysis was to "determine if we could actually see the effects of [the] flooding [of the Management Area] in the tree growth record." Tr. 3241:17-19 (Grissino-Mayer). Because flooding will often lead to stunted tree growth and "the loss of crown mass" when a tree is inundated by water, "it will produce a very characteristic narrow set of tree rings." Tr. 3239:19-23 (Grissino-Mayer).

Dr. Grissino-Mayer compared tree-core data from 1980 to 1992 with tree-core data from 1993 to 1999, and found "no statistical difference in tree growth . . . [;] if anything, there were a few instances where it showed that tree growth [wa]s actually statistically greater in the 1993 to 2000 period." Tr. 3281:18 to

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[14] The Commission criticized the sampling methodology employed by Mr. Williams on the grounds that tree cores were collected outside planned plot boundaries when no living trees were present on particular plots and that cores were collected from clustered samples within plots. *See, e.g.*, Tr. 2445:3 to 2447:4 (Baker). In addition, the core samples were taken in the summer of 2007, which manifestly excluded trees that had died in 1999 and 2000.

3282:1 (Grissino-Mayer); *see* DX 309 at 22 (Analyses of Tree Growth for Two Oak Species Growing in the Management Area (Apr. 9, 2008)) ("Grissino-Mayer Report"). Similarly, he found no statistical difference in tree growth from 1993 to 2000 when comparing the high-mortality sites of Gar Slough and Schaeffer's Eddy with lower-mortality sites. DX 309 at 23 (Grissino-Mayer Report). In addition, Dr. Grissino-Mayer sought to determine whether the cores contained any "flood rings" – malformed tree rings that are indicative of tree growth under conditions of inundation. Tr. 3301:21-25 (Grissino-Mayer). Dr. Grissino-Mayer "never found a single flood ring in any of the cores, not just during the '93 to 2000 period, but anywhere in the[] cores." Tr. 3302:14-16 (Grissino-Mayer).

7. Susceptibility of oak trees to harm from standing water and saturated soil.

The presence of standing water or saturated soil can adversely affect the feeder roots of oak trees to the point where the tree can be injured or killed. PX 80 at 9 (Kingwood Report I). Although bottomland hardwood trees are adapted to develop under wintertime flooding regimes where the water is cold and adequately oxygenated, these same trees are less well equipped to cope with summertime flooding, where warm air temperatures dissipate the oxygen in the water and saturated soil and cause the trees to switch to anaerobic respiration. Tr. 2392:13 to 2393:5 (Baker). The toxic byproducts of anaerobic respiration, along with the inability of the affected trees to produce adequate energy, often lead to tree mortality. Tr. 2393:5-9 (Baker). "Under . . . prolonged flooded conditions, . . . the roots begin to die, and it can begin

to affect [the oak tree's] ability to pull in nutrients, and water, and be able to photosynthesize." Tr. 3345:4-7 (King). Red oaks have some degree of flood tolerance; as both parties' expert witnesses agreed, one year of flooding-induced anaerobic respiration during the growing season is insufficient to kill nuttall and overcup oaks. Tr. 2393:21 to 2394:1 (Baker); Tr. 3344:21-24 (King). However, because the effects of flooding are cumulative, nuttall oak trees are likely to die when forced to switch to anaerobic respiration for three or more growing seasons in a row, as are overcup oak trees when faced with the same situation for four or more growing seasons in a row. Tr. 2393:21 to 2394:10 (Baker); Tr. 3344:25 to 3345:2 (King); *see also* PX 80 at 9 (Kingwood Report I) ("Loss of oxygen associated with increased water temperature in stagnate water during the summer months is a common cause of root mortality in flooded timber.").

Nuttall, overcup, and other oak trees have a fibrous root system composed of surface feeder roots, typically located within the first twelve inches of soil, along with other roots that are located within the first thirty-six inches of soil. Tr. 2391:18 to 2392:8 (Baker). When an oak tree's root system is damaged, it often responds by trying "to recover" its root system as quickly as possible. Tr. 2390:18-22 (Baker). One manner in which it can quickly recover its roots in wet conditions is by developing relatively small carrot-like roots – called root suckers – that attach to the base of its larger primary roots in an epicormic fashion. Tr. 2390:22 to 2391:15 (Baker). These root suckers are essentially a means by which the oak tree attempts to develop new "feeder root mass" after it has suffered damage. Tr. 2460:16-25 (Baker).

However, when flooding is followed by drought conditions, the trees often suffer mortality due to their loss of the normal feeder roots. *See* Tr. 3345:14-20 (King). The death of the tree's roots leads to an imbalance in the tree's top-to-root ratio, such that the reduced root mass can no longer support the crown; in this situation, the tree will shed part of its canopy and initiate die-back in its crown to rebalance its root system. PX 80 at 9 (Kingwood Report I); Tr. 2408:12 to 2409:8 (Baker). This die-back recovery mechanism then renders the tree more susceptible to attack from insects and other pathogens, as well as to mortality from wind throw and drought. PX 80 at 9-10 (Kingwood Report I); Tr. 3345:8-11 (King).

8. Invasion of wetland species.

Kingwood Forestry Services also reported that as the tree canopy was disintegrating, various wetland species were beginning to invade the forest floor. Tr. 754:10-12 (Blaney). Dr. Baker observed that the bottomland hardwood trees "were being replaced by wetland species in the understory -- buttonbush, smartweed, lizard tail, cyprus seedlings, black willow -- species that can tolerate a saturated soil condition throughout the year." Tr. 2399:25 to 2400:10 (Baker). In comparing the understory of the nuttall oaks to a "swamp situation," Dr. Baker testified that "[t]hroughout all five of those areas that were being impacted by the flooding, there was unusual density and abundance of wetland vegetation that I have never seen growing in [a] bottom-land hardwood stand." Tr. 2397:22 to 2398:9 (Baker). This testimony reflected Kingwood's findings that

> wetland indicator species were invading and occupying the understory, particularly underneath dead and dying trees where sunlight was sufficient. Except for the two control stands, little or no reproduction of overstory tree species were present in the understory, even in stands that had been thinned in the last 10 to 15 years for the specific purpose of promoting establishment of reproduction.

PX 80 at 8 (Kingwood Report I).

The wetland species are more adept than bottomland hardwood trees at surviving in saturated soil conditions because they have metabolic pathways that enable them to operate under anaerobic conditions. Tr. 2389:7-13 (Baker). In 2000, Dr. Baker estimated that most of the buttonbush trees he observed were five to six years old, meaning that they had started to grow in the mid-1990s. Tr. 2398:16-20 (Baker); PX 80 at 8 (Kingwood Report I). He also observed that these and other wetland species were far more dominant in the areas that had been flooded than in the two control stands. Tr. 2398:21 to 2399:10 (Baker). Mr. Hausman testified that germinated acorns had been the only ground cover in the forest when he began working for the Commission in 1984, but that the forest floor had "changed drastically" since then and was "now covered with a lot of undesirable wetland species . . . [such as] buttonbush and smartweed, wetland plants, cardinal, [and] cutgrass." Tr. 1191:13 to 1192:20 (Hausman); *see also* Tr. 63:4-11 (Zachary).

D. Drought, Beaver Dams

The years of 1999 and 2000 were moderate drought years, with annual precipitation approximately ten inches below the normal rainfall of fifty inches per year during both years. Tr. 2351:16-21, Tr. 2444:1-6 (Baker); Tr. 2702:6-10 (Overton). Much of the drought occurred during the growing season. *See* Tr. 2351:19-21 (Baker); PX 419 at AGFC10594 (Field Notebook of Baker) (Oct. 10, 2000). As a result, there was less water in Clearwater Lake, and less water to be released via the Clearwater Dam into the Black River south of Clearwater Lake. Tr. 1234:12-15 (Hausman).

Dr. Baker testified that "the summer drought in 1999 and 2000 was kind of the thing that tilted the scale." Tr. 2437:22-23 (Baker); *see* Tr. 3371:21-24 (King) (testifying that "the drought made that mortality acute in terms of the percentage of trees that were killed or the number of trees that were killed"). The drought "resulted in unusual drying of soils and water stems because of an imbalance of tips/roots . . . [which] results in rapid and excessive mortality of low vigor trees." PX 419 at AGFC10594 (Field Notebook of Baker). Accordingly, when the drought occurred,

> those huge nut[t]all oak trees, something 36, 48 inches in diameter with crowns almost as big as this courtroom, but root systems not much larger than this desk, they could not support that crown, and that's why you had your brownout. . . . [T]hey would run out of nutrients

> because those roots could not supply those big tops, and those leaves would brown out or die.

Tr. 2438:5-15 (Baker).

On the other hand, the trees likely would not have seen significant increases in their mortality as a result of the drought "if they had not . . . been subjected to the flooding." Tr. 2444:6-9 (Baker); *see* Tr. 3359:2-5 (King). Dr. Baker ascribes the trees' inability to survive the drought to the fact that they had already "lost half of their root systems or more" due to the flooding. Tr. 2444:6-9 (Baker). By contrast, the trees in the control stands, which had not suffered similar damage to their root systems, were able to survive the drought. Tr. 2444:10-14 (Baker).

As a separate matter, the increasing presence of beaver dams in the Management Area has resulted in the occasional blockage of the water-control systems that are used to drain the GTRs. *See* PX 500 at 27 (Heitmeyer Report); *see also* JX 23 at AGFC2963 (Master Plan) (describing impacts on Arkansas farmers "from the rapidly expanding beaver population"). In response, the Commission has employed various techniques to manage the beaver population, including trapping and shooting. Tr. 112:17-20 (Zachary); Tr. 1266:4-18 (Hausman). It has also sought to "locate and breach the largest of beaver dams and obstructions," typically by using dynamite to destroy these impediments to surface flows of water. PX 500 at 27 (Heitmeyer Report); Tr. 1267:2-25, 1854:16-20 (Hausman) (stating that roughly twenty-five to fifty beaver dams were dynamited each year); *see* JX 94 to JX 101 (Log Books of Clinton

Hancock from 1993 to 2000) (indicating beaver management practices).

In 2001, the Commission initiated a more intensive eradication program by contracting with Nuisance Animal Control, Inc. DX 310 at 22 (Nutter Report); JX 72 at AGFC3928 (Sealed Bid Approval/Waiver Form Between the Commission and Nuisance Animal Control, Inc. (Sept. 24, 2001)); Tr. 113:19-25 (Zachary); Tr. 1037:13-21 (Test. of Mr. Hugh Durham, Director of the Arkansas Game & Fish Commission from June 2000 to March 2003). The beaver locations observed by the Commission's contractor were later plotted on an aerial photo of the Management Area by Dr. Nutter. DX 310 at Figure 27 (Nutter Report). Dr. Nutter testified that the concentrations of timber damage "appear[ed] in many places to be right in the locations where [the contractor] found the preponderance of beaver activity." Tr. 3116:6-9 (Nutter). Dr. Nutter's report concluded that the drainage problems caused by beavers "extended the period of standing water in the GTRs and the flood plain sites where beaver were know[n] to have occurred." DX 310 at 23 (Nutter Report).

STANDARDS FOR DECISION

The Takings Clause of the Fifth Amendment provides that "private property [shall not] be taken for public use, without just compensation." U.S. Const. amend. V. The inquiry into whether a compensable taking has occurred requires this court to resolve "a question of law based on factual underpinnings." *Wyatt v. United States*, 271 F.3d 1090, 1096 (Fed. Cir. 2001) (citations omitted); *see Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1005 (1984) (stating that courts

perform "an 'ad hoc, factual' inquiry" in analyzing whether a compensable taking has occurred (quoting *Kaiser Aetna v. United States*, 444 U.S. 164, 175 (1979))).[15] In this case, the Commission, as plaintiff, bears the burden of proving the relevant factual underpinnings of its claim against the United States, and must generally proffer "'evidence which is more convincing than the evidence which is offered in opposition to it.'" *Jazz Photo Corp. v. United States*, 439 F.3d 1344, 1350 (Fed. Cir. 2006) (quoting *Hale v. Department of Transp., Fed. Aviation Admin.*, 772 F.2d 882, 885 (Fed. Cir. 1985)).

To establish a viable takings claim, the Commission must prove two things. First, the Commission must establish that it had "a property interest for purposes of the Fifth Amendment." *Members of the Peanut Quota Holders Ass'n v. United States*, 421 F.3d 1323, 1330 (Fed. Cir. 2005); *Wyatt*, 271 F.3d at 1096 ("[O]nly persons with a valid property interest at the time of the taking are entitled to compensation."). Second, the Commission must establish that the government's actions "amounted to a compensable taking of that property interest." *American Pelagic Fishing Co., L.P. v. United States*, 379 F.3d 1363, 1372 (Fed. Cir.

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[15] The Tucker Act, providing that "[t]he United States Court of Federal Claims shall have jurisdiction to render judgment upon any claim against the United States founded . . . upon the Constitution," 28 U.S.C. § 1491(a), grants this court subject matter jurisdiction to evaluate takings claims against the United States and its agencies. *See Preseault v. Interstate Commerce Comm'n*, 494 U.S. 1, 12 (1990).

2004).[16] In clarifying this standard, this court has held that a plaintiff, to prove a compensable taking, must demonstrate that the government's actions were the "direct and proximate cause" of the harms to its property interest. *See Loesch v. United States*, 645 F.2d 905, 913 (Ct. Cl. 1981) (finding no such causation in the context of governmental action *vis-a-vis* a raised level of water on a landowner's property).[17]

In an inverse condemnation case such as this, where the landowner seeks to "recover[] just compensation for a taking of his property when condemnation proceedings have not been instituted," *United States v. Clarke*, 445 U.S. 253, 257 (1980), the Federal Circuit has added an intent-based test to the traditional inquiry into causation and imposed a stricter standard as to what constitutes an "appropriation" of plaintiff's property interest. *See*,

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[16] As the Federal Circuit has noted, "'the Constitution does not itself create or define the scope of "property" interests protected by the Fifth Amendment. Instead, "existing rules and understandings" and "background principles" derived from an independent source, such as state, federal, or common law, define the dimensions of the requisite property rights for purposes of establishing a cognizable taking.'" *Schooner Harbor Ventures, Inc. v. United States*, __ F.3d __, __, 2009 WL 1668504, at *3 (Fed. Cir. 2009) (quoting *Air Pegasus of D.C., Inc. v. United States*, 424 F.3d 1206, 1213 (Fed. Cir. 2005)).

[17] The Federal Circuit has additionally required victims of government-induced flooding to "establish that treatment under takings law, as opposed to tort law, is appropriate under the circumstances." *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003) (citing *Barnes v. United States*, 210 Ct. Cl. 467 (1976), for the proposition that "[g]overnment-induced flooding not proved to be inevitably recurring occupies the category of mere consequential injury, or tort").

e.g., *Ridge Line*, 346 F.3d at 1355. Under the intent-based test, a plaintiff must demonstrate either that "the government intend[ed] to invade a protected property interest" or that "the asserted invasion [was] the direct, natural, or probable result of an authorized activity and not the incidental or consequential injury inflicted by the action." *Cary v. United States*, 552 F.3d 1373, 1377 (Fed. Cir. 2009) (quoting *Ridge Line*, 346 F.3d at 1355). With respect to the appropriation of plaintiff's property interest, the Federal Circuit has stated that "to constitute a taking, an invasion must appropriate a benefit to the government at the expense of the property owner, or at least preempt the owner[']s right to enjoy his property for an extended period of time, rather than merely inflict an injury that reduces its value." *Ridge Line*, 346 F.3d at 1356.[18] Finally, the plaintiff must demonstrate that there are no intervening causes that would break the "chain of causation" between the governmental action and plaintiff's injury. *Cary*, 552 F.3d at 1380; *Moden v. United States*, 404 F.3d 1335, 1344 (Fed. Cir. 2005) ("[I]njury may not be foreseeable if any intervening cause breaks the chain of causation.").

The Commission has acknowledged that it bears the burden of proof in this case, and correctly states that it must prove by a preponderance of the evidence the following factual elements

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[18] These foreseeability and appropriation requirements go above and beyond plaintiff's obligation to prove causation. *Moden*, 404 F.3d at 1343 ("In addition to causation, an inverse condemnation plaintiff must prove that the government should have predicted or foreseen the resulting injury.").

> 1. The United States released water from Clearwater Lake Dam that proximately and directly caused [the Commission's] timber property to be subject to flooding;
>
> 2. The resulting flooding produced substantial damage to [the Commission's] timber property; and
>
> 3. The United States (*i.e.*, through its actions deviating from the Authorized Water Control Plan for the Black River) either intended to and did take [the Commission's] property, or it performed actions the natural consequence of which were to take [the Commission's] property.

Pl.'s Post-Trial Br. at 4-5.

ANALYSIS

I. Property Interest at Issue

"[P]rivate property" for purposes of the Fifth Amendment may take many forms. Among other things, such property includes "property [that] has been dedicated by the State to public use." *California v. United States*, 395 F.2d 261, 264 (9th Cir. 1968) (citing *United States v. Carmack*, 329 U.S. 230, 242 (1946); *City of St. Louis v. Western Union Tel. Co.*, 148 U.S. 92, 101 (1893)). In this instance, it is uncontested that the Commission, an entity of the State of Arkansas, held a valid property interest in the Management Area, including timber on that land, at the time of the alleged taking. Stip. ¶ 4. There thus is no question but that the Commission held "'a protectable property interest in what it alleges the government has taken.'" *Moden*, 404 F.3d at 1342

(quoting *Ridge Line*, 346 F.3d at 1355). Additionally, the parties concur, as they must, given the facts, that the superinduced flows of water would constitute a physical, not a regulatory, taking, and that the flows were temporary in the sense that they occurred during each growing season from 1993 through 2000.

Here, the Commission refers to its "timber resources on [the Management Area]" as the property which was taken in contravention of the Fifth Amendment. Compl. ¶¶ 27-28. However, the contours of the relevant property interest in this case are a matter of some complexity, given the parties' lengthy debate over the effect of the Corps of Engineers' releases of water into a river flowing through the Management Area. Thus the court will first analyze the scope of the property interest at issue by addressing the parties' arguments about the relationship between the water releases and the timber in the Management Area. Thereafter, the court will address the "intent to invade" and "appropriation of a benefit" tests for an inverse condemnation claim. *See infra*, at Parts I.B and I.C (addressing questions of appropriation and foreseeability as a preamble to the inquiry into causation).

A. The Scope of the Property Interest at Issue

In relation to its claim of taking of its property interest in timber, the Commission asserts that "it has alleged and proven that the Corps' actions took a temporary flowage easement over the [Management Area]." Pl.'s Reply at 6. Courts have been in agreement that the taking of a flowage easement without just compensation can constitute a violation of the Fifth Amendment. *See Pumpelly*, 80 U.S. (13

Wall.) at 172 ("The backing of water so as to overflow the lands of an individual . . . if done under statutes authorizing it for the public benefit, is such a taking as by the constitutional provision demands compensation."); *Dickinson*, 331 U.S. at 748 ("Property is taken in the constitutional sense when inroads are made upon an owner's use of it to an extent that, as between private parties, a servitude has been acquired either by agreement or in course of time."); *Ridge Line*, 346 F.3d at 1353 ("[G]overnment actions may not impose upon a private landowner a flowage easement without just compensation."). Yet, the Commission avers that it "is *not* seeking compensation for the taking of a flowage easement over the Black River WMA, but instead, similar to the plaintiff in *Cooper* [*v. United States*, 827 F.2d 762, 762 (Fed. Cir. 1987)], . . . is seeking compensation for the destruction and taking of its timber, plus for the necessary silvacultural restoration." Pl.'s Post-Trial Br. at 3; *see* Cl. Tr. 18:2-3 (setting out an argument by plaintiff's counsel that "[t]he Corps committed a taking of the Commission's valuable timber resource").

If construed in an overly simplistic way, *Cooper* could be a confusing precedent. In effect, it applies the longstanding *Pumpelly* line of cases from the Supreme Court, but it does so by discounting a flowage-easement claim. *See Cooper*, 827 F.2d at 763-64. In *Cooper*, the Corps of Engineers in the course of construction activities on a river in Mississippi created an obstruction that flooded plaintiff's land. *Id.* at 762. By the time the blockage was removed, plaintiff's land, and the timber on that land, had been inundated for long periods of time during five consecutive growing seasons. *Id.* The trial court in that case identified a temporary flowage

easement as the relevant property interest that the government had taken from the landowners. *Cooper v. United States*, 11 Cl. Ct. 471, 475 (1987). On appeal, however, the Federal Circuit rejected the trial court's conclusion, observing instead that "although the government may have taken a flowage easement, the plaintiff does not seek compensation for it. Therefore, this case is not controlled by . . . cases . . . dealing with flowage easements." *Cooper*, 827 F.2d at 763. In short, because the plaintiff in *Cooper* did not seek to measure compensation based upon the taking of a flowage easement, but rather upon the timber destroyed and damaged by the flowage easement, the court found no basis for describing a flowage easement as the locus of the taking. *Id.* at 763. Instead, the court stated that "the taking under consideration is a taking of timber." *Id.* at 764.

Manifestly, in this case, *Cooper* guided the Commission's focus on the timber taken as the measure of the compensation due, even though a temporary flowage easement was the root cause for, and embedded within, the Commission's claim. Now, somewhat disingenuously, the government argues that the Commission, correlatively with the plaintiff in *Cooper*, "waived its claim for [a] flowage easement" and that "timber . . . was the only property interest claim ever identified that the United States may have taken." Cl. Tr. 45:14-20; Def.'s Post-Trial Br. at 10 (arguing that the Commission "waived any claim that the United States acquired a flowage easement" over its property). This argument is sophistic. Certainly, no *permanent* flowage easement in the Management Area was taken by the flooding attributable to the Corps' deviations from the operating plan for the Clearwater Dam. And, a temporary flowage easement

is not invoked by the Commission as the relevant property interest for purposes of measuring compensation. Nonetheless, a *temporary* flowage easement is a necessary foundation for the Commission's takings claim, as has always been evident from the Commission's pleadings and proofs.

The government acknowledges that the existence of additional water released downstream from Clearwater Dam by the Corps of Engineers during the deviations from the water control plan – in short, the flowage easement – represents "the factual underpinnings of the claimed taking of the timber." *See* Cl. Tr. 46:10-14. At the outset of this litigation, the Commission alleged that the Corps of Engineers "authorized and directed a pattern of water releases from Clearwater Lake that caused repeated flooding of bottomland hardwood timber during the growing season on [the Management Area]" and that this sustained inundation "caused extensive death and destruction of timber." Compl. ¶¶ 25-26. At trial, analogously to the facts in the *Pumpelly* line of precedents, the Commission then sought to prove that its property was inundated by excessive flows caused by upstream governmental action. The recent decisions by the Federal Circuit are fully in concord in this respect. *See Cary*, 552 F.3d at 1380 (restating the holding in *Ridge Line* that sporadic inundation of a plaintiff's land through increased storm water runoff caused by governmental development gives rise to the acquisition of a flowage easement).

As *Cooper* indicates, the Commission could look to timber as a measure of what was taken, even though a flowage easement over its property was the underlying progenitor. *See* Pl.'s Reply at 6. It is

evident that the Corps of Engineers took a temporary flowage easement over the Commission's property as demonstrated by water gauge levels from 1993 to 1999 indicating higher-than-normal levels in the river, *see* PX 500 at 13 (Heitmeyer report) (summarizing Corning gauge data), and evidence concerning the Corps of Engineers' deviations from the original water control plan from 1993 to 2000 indicating higher-than-originally-planned releases of water into the river. Stip. ¶ 15. In the circumstances, the Commission's failure specifically to use the words "flowage easement" to describe what was taken has no magical effect. Superinduced additions of water and a resulting temporary flowage easement have always been embedded within the Commission's claim for the taking of its timber. Accordingly, because the character of the alleged taking – along with the Commission's claim for additional damages, addressed *infra* in Part IV – hinges upon the effect of the Corps of Engineers' temporary flowage easement on timber within the Management Area, the court will address these property interests in tandem in analyzing the character of the taking.

B. Character of the Taking

The government questions whether the character of the Corps' flows from the Clearwater Dam interfered with the Commission's property to the point where the resulting flooding constituted an appropriation. Def.'s Post-Trial Br. at 9. The controlling standard for this threshold inquiry into the character of a taking is whether the government appropriated a benefit at the expense of the Commission "or at least preempt[ed] the [Commission's] right to enjoy [its] property for an

extended period of time." *Ridge Line*, 346 F.3d at 1356. To satisfy this standard, the Commission's complaint "must allege that 'the government's interference with any property rights of [the Commission] was substantial and frequent enough to rise to the level of a taking.'" *Cary*, 552 F.3d at 1380 (quoting *Ridge Line*, 346 F.3d at 1357). Although "[o]ne flooding does not constitute a taking," *Hartwig v. United States*, 485 F.2d 615, 620 (Ct. Cl. 1973) (internal quotation and citations omitted), compensation is permitted where a landowner can demonstrate that governmental actions subjected his or her land "to intermittent, frequent, and inevitably recurring floodings." *Fromme v. United States*, 412 F.2d 1192, 1196 (Ct. Cl. 1969); *see also Ridge Line*, 346 F.3d at 1357 ("'[I]solated invasions, such as one or two floodings . . ., do not make a taking . . ., but repeated invasions of the same type have often been held to result in an involuntary servitude.'" (quoting *Eyherabide v. United States*, 170 Ct. Cl. 598, 604 (1965))).

1. "[I]ntermittent, frequent, and inevitably recurring floodings."

As a starting point, the circumstances of the *Pumpelly* line of precedents provide useful benchmarks. In *Pumpelly*, the Supreme Court found a constitutional taking "where real estate [was] actually invaded by superinduced additions of water . . . so as to effectively destroy or impair its usefulness." 80 U.S. (13 Wall.) at 181. Subsequently, in *Lynah*, the Supreme Court held that a taking occurred "where the government by the construction of a dam or other public works so floods lands belonging to an individual as to substantially destroy their value." 188 U.S. at 470. Although these early takings

cases involved permanent flooding of the plaintiffs' property, *e.g.*, the landholder in *Lynah* saw his rice field transformed by flooding into "an irreclaimable bog," 188 U.S. at 469, the same principles were applied in later cases to situations involving intermittent or temporary flowage easements. Entitlement to compensation for a taking of an easement was granted in *Dickinson* where plaintiff's land was subject to intermittent flooding over and above a level at which the river abutting plaintiff's property had previously been flooded. 331 U.S. at 751. Citing *Dickinson*, the Federal Circuit has held that a plaintiff need not show that its property "suffer[ed] an effectual destruction or a permanent and exclusive occupation by government runoff" to recover on a takings claim based on a flowage easement. *Ridge Line*, 346 F.3d at 1358. Rather, recovery based on a government's taking would be permitted even if the landowner eventually was able to reclaim his land or the intrusions of water were halted. *Id.* at 1353.

In this instance, the evidence adduced at trial shows that the Corps' deviations from the operating plan for the Clearwater Dam led to flows from the Dam that regularly inundated portions of the Management Area during the growing season to an extent not experienced previously. Water-level gauge data from Corning, located just upstream of the Management Area, provide explicit evidence in this regard. For six years, from 1993 through 1998, flows at Corning were higher, and stayed higher, during the growing season than during prior years. *See supra*, at 11-12 (describing Corning water-level gauge data analyzed by Dr. Heitmeyer). These water-gauge results at Corning can be correlated to the inundation of portions of the Management Area by looking to

observations made during the Corps' test releases from the Clearwater Dam in March 2001. At a six-foot level on the water gauges at Corning, substantial parts of the forest in the Management Area were flooded. *See supra*, at 10 (discussing the results reported in PX 637 at US 545 (E-mail from Raible to Hendricks)). Dr. Heitmeyer's analysis of the gauge data at Corning and the inundation of portions of the Management Area was persuasive and instructive, showing that when the Black River was at a level of five feet as measured at the Corning gauge, thirty percent of the nuttall oaks in the Management Area would be inundated, and at a level of six feet at the Corning gauge, fifty percent of the nuttall oaks could be flooded. PX 500 at 30 (Heitmeyer Report). And, because of the sustained nature of the releases from Clearwater Dam in growing seasons during the deviation years, the flood waters would stay on the affected portions of the Management Area for an extended period. *See supra*, at 12-13 (discussing Dr. Overton's analysis of the Corning water-gauge data, reflected in PX 506 at Figure 3 & Table 2 (Overton Report)).

Accordingly, the Commission has met its burden of proving that the Corps' releases were "intermittent, frequent, and inevitably recurring floodings" that support a taking, *Fromme*, 412 F.2d at 1196, rather than "'isolated invasions'" that might merely constitute a tort. *Ridge Line*, 346 F.3d at 1357 (quoting *Eyherabide*, 17 Ct. Cl. at 604).

2. *Appropriation of aspects of the Commission's property.*

In focusing the court's attention on the property interest in its timber, the Commission argues that "the

present action has important factual and legal similarities to *Cooper*," in which recovery was based on a taking of timber. Pl.'s Reply at 5. The government responds by contending that the Commission was able to "access[] the [Management Area] throughout the period of dispute, and could have harvested its trees." Def.'s Post-Trial Br. at 11. On this basis, the government would distinguish *Cooper* where the United States "continuously inundated the timber for five years, preventing access to, and harvesting of, the trees." *Id.*; *see* Cl. Tr. 41:14-17. The government adds that the Commission was able to conduct timber sales during the years in which the taking allegedly occurred, and that any deficiency as to timber harvesting during those years "was based on [p]laintiff's management priorities, not the Corps' deviations." Def.'s Post-Trial Br. at 11 (citing DX 308 at 43 (listing timber sales)). Accordingly, argues the government, the Corps never appropriated the Commission's property interest in its timber. Cl. Tr. 41:12-14; *see* Def.'s Post-Trial Br. at 11 (citing *Cary*, 552 F.3d at 1381, for the principle "that floods that do not appropriate the landowner's property do not rise to the level of a taking even if the flood causes permanent damage.").

In this regard, the government's argument misconstrues and misapplies the principle invoked by the Federal Circuit's decision in *Cary*. That decision involved a claim that a forest fire that damaged landowners' properties was caused by the government's land management policies. *Cary*, 552 F.3d at 1375. In addressing the appropriation prong of *Ridge Line*, the *Cary* court looked to flooding cases. *Id.* at 1380-81. It commented that "floods that visit once and then recede" were insufficiently permanent

to represent an appropriation of the landowner's property, in contrast to flooding that "creates a 'permanent liability' because of 'intermittent but inevitably recurring overflow.'" *Id.* at 1381 (quoting *Cress*, 243 U.S. at 328). For the Management Area, the inundations during growing seasons from 1993 through 1999 were recurrent and constituted an appropriation, albeit a temporary rather than permanent one because the Corps terminated its deviations. Reflecting the persistence of the Corps' temporary flowage easement, the damage done to the Commission's property interest in its timber was permanent rather than temporary, and the Commission was preempted from exercising its property rights over its timber during and after the Corps' deviations. Plaintiff offered copious evidence of this appropriation. The timber affected by the flowage easement saw a marked decline in its value due to mortality and rapid degradation. Tr. 2287:13-21 (Foster); PX 80 at 18 (Kingwood Report I). In addition, the dead and declining timber was distributed irregularly throughout the Management Area, which "ma[de] salvage logging inefficient and, therefore, unusually expensive." Tr. 2288:13-25 (Foster). Moreover, although the affected areas were showing a decline in timber during the early years of the deviations, the moderate drought in 1999 and 2000 led to a relatively sudden collapse; the adverse effect of persistent flooding and saturated soil during growing seasons damaged root systems to the point that the advent of dry weather rendered the roots incapable of supporting trees. *See supra*, at 17-18 (discussing die-back of surface feeder roots in flooded or saturated soils and the formation of small, carrot-like root suckers in epicormic fashion from larger primary roots). Thus, despite the government's objections that

some timber was still harvestable during the period of the deviations, in general, the government's superinduced flows so profoundly disrupted certain regions of the Management Area that the Commission could no longer use those regions for their intended purposes, *i.e.*, providing habitat for wildlife and timber for harvest. *See* PX 80 at 18 (Kingwood Report I) (assessing significant losses to merchantable value of declining timber).

Instructive as to appropriation are two other takings cases, *United States v. Causby*, 328 U.S. 256 (1946); and *Reed Island-MLC, Inc. v. United States*, 67 Fed. Cl. 27 (2005). In *Causby*, low-flying Army aircraft flew directly above plaintiffs' land, causing many of plaintiffs' chickens to fly into walls from fright and be killed. 328 U.S. at 259. The government's actions were held to amount to a compensable taking despite the fact that "enjoyment and use of the land [was] not completely destroyed." *Id.* at 262. The Supreme Court reasoned that

> [t]he path of glide for airplanes might reduce a valuable factory site to grazing land, an orchard to a vegetable patch, a residential section to a wheat field. Some value would remain. But the use of the airspace immediately above the land would *limit the utility of the land and cause a diminution in its value.*

328 U.S. at 262 (emphasis added). Similarly, in *Reed Island*, this court found a taking where a government-imposed geographic margin of safety attendant to active operation of a munitions-loading facility "effectively forestalled" habitation on the landowner's property, and thus took the intended use,

namely, the sale of lots for homes on that property to third parties, even though the property could still be put to other limited uses. *See* 67 Fed. Cl. at 35 & n.12.

Here, as in those cases, the government, by persistent flows affecting the Management Area, disrupted the Commission's uses and thereby appropriated a property interest. Accordingly, the government's contention that the Commission "continued to use its property as the [Management Area] as they had before the deviations and after the deviations," Cl. Tr. 50:19-21, is not accepted. Instead, the Commission was effectively deprived of its right to full enjoyment of its property during the period of the deviations.

As the Supreme Court observed in *Pumpelly*,

> [i]t would be a very curious and unsatisfactory result, if . . . it shall be held that if the government refrains from the absolute conversion of real property to the uses of the public it can destroy its value entirely, can inflict irreparable and permanent injury to any extent, can, in effect, subject it to total destruction without making any compensation, because, in the narrowest sense of that word, it is not taken for the public use. Such a construction would pervert the constitutional provisions into a restriction upon the rights of the citizen, as those rights stood at the common law, instead of the government, and make it an authority for invasion of private right under the

> pretext of the public good, which had no warrant in the laws or practices of our ancestors.

80 U.S. (13 Wall.) at 177-78.

C. Foreseeability

Notably, the Federal Circuit has held that "proof of causation, while necessary, is not sufficient for liability in an inverse condemnation case." *Moden*, 404 F.3d at 1343. As part of the threshold demonstration of whether a plaintiff in an inverse condemnation claim has stated a takings claim as contrasted to a claim sounding in tort law, a landowner must demonstrate "that the government intended to invade a protected property interest." *Cary*, 552 F.3d at 1377. In this respect, it is not necessary to show that the government specifically intended to invade and injure the property; rather, the standard for intent allows recovery based on injuries that are the direct, natural, predictable, or probable result of governmental action. *See Cary*, 552 F.3d at 1377; *Ridge Line*, 346 F.3d at 1356. That is, a court can infer governmental intent to invade a property interest where the plaintiff proves that "'the government *should have* predicted or foreseen the resulting injury.'" *Cary*, 552 F.3d at 1377 (quoting *Moden*, 404 F.3d at 1343) (emphasis added). On the other hand, if landowners suffered "an incidental or consequential injury . . . caused, for example, by improvident conduct on the part of the government in managing its property," such landowners are more suited to plead for recovery under tort law. *Ridge Line*, 346 F.3d at 1356. In applying this distinction between a foreseeable injury and a merely incidental injury, the Federal Circuit has

required plaintiffs to demonstrate that their injury was "the likely result of the [government's] act, not that the act was the likely cause of the injury." *Cary*, 552 F.3d at 1377 (citing *Moden*, 404 F.3d at 1343). Accordingly, these foreseeability elements will be addressed before determining the strength of the causative links between the government's deviations and the Commission's claimed taking.

1. Predictability of downstream flooding.

The Corps of Engineers did not actually know in 1993 that the increased river levels caused by deviations from the water control plan would cause additional flooding in the Management Area. Indeed, the Corps' staff believed as late as February 2001 that the deviations had no effect on the Black River beyond the Missouri-Arkansas boundary. *See supra*, at 7, 9 (addressing JX 14 at AGFC298 (Clearwater Lake Environmental Assessment), JX 187 at US570 (E-mail from Hendricks to Miller (Feb. 26, 2001)). The question thus presented becomes whether such flooding *should* have been foreseen, based, for instance, on information that the Corps had or could have gathered prior to initiating the deviations from the authorized water control plan. *See Moden*, 404 F.3d at 1343 ("[A]n inverse condemnation plaintiff must prove that the government should have predicted or foreseen the resulting injury."); *Cary*, 552 F.3d at 1379-80 (accord). On the point of foreseeability of governmental action, the Federal Circuit has approvingly quoted the analysis offered by the Court of Claims in *Cotton Land Co. v. United States*, 75 F. Supp. 232 (Ct. Cl. 1948):

> "If engineers had studied the question in advance they would, we suppose, have predicted what occurred. If they had studied the question in advance and had said, in a report, 'If you build Parker Dam to a crest of 450.4 feet, the pool will cover the land described below. The effect of the flow of the river into the pool will be to form a delta which, within approximately three years will raise the bed and the surface of the river, will cause it to overflow its banks and will thus inundate the lands described below,' would the fact of that formal forewarning be a decisive fact in such a suit as this? Should the fact that the engineering study was not so complete as to include a prediction as to lands beyond the bed of the reservoir prevent a court from looking at the actual and natural consequences of the [g]overnment's act?"

Ridge Line, 346 F.3d at 1357 (quoting *Cotton Land Co.*, 75 F. Supp. at 233-34). As applied in *Cotton Land*, this analysis led the court to find a taking where the government's construction and operation of a dam did not directly result in flooding but instead initiated "a succession of events . . . which . . . in their natural order, deprived the company of the beneficial use of its land." 75 F. Supp. at 233 (rejecting a defense that the cause of the taking was too remote).

Here, the Commission argues that the Corps had the responsibility for "determin[ing] whether the deviation changes in the Black River regulating stages and durations would produce negative impacts," and the Corps should have been able to "predict[] the downstream flooding with specificity" based on an

evaluation of the hydrologic effects of deviations from the water control plan. Pl.'s Reply at 9-10. The Commission contends that "the direct, natural, and probable impact of the Corps' authorized actions . . . was to artificially sustain the Black River at levels sufficient to inundate significant portions of the bottomland areas that exist along the Black River, including the [Management Area], for extended periods during the critical growing season." *Id.* at 10. Finally, the Commission concludes that the foreseeable result of "[s]ubjecting the [Management Area] to multiple consecutive years of such flood conditions" was an increase in timber mortality and growth of hazardous wetland species. *Id.* at 10-11.

The commonly held view in 1993, and up until at least 1996, was that deviations from the authorized water control plan at Clearwater Lake would not affect locations so far downstream the Black River as the Management Area. Tr. 209:11-20 (Hicklin) (acknowledging the opinion of the Corps that the influence of releases from Clearwater Dam would diminish before the state line between Missouri and Arkansas); JX 14 at AGFC278 (Clearwater Lake Environmental Assessment) (stating "the influence of Clearwater Dam is diminished by the time the Black River reaches the Missouri/Arkansas State line"); Tr. 211:13-19 (Hicklin) (indicating that the Corps had no knowledge prior to the draft environmental assessment "that a four-foot Poplar Bluff regulating stage would cause backwater flooding at the [Management Area]"); *see also* Cl. Tr. 89:9-13 (plaintiff's acknowledgment that this view was widespread). As a result, the draft version of the Corps' environmental impact statement would have found "no significant impact" based on the proposed

revisions to the authorized water control plan. JX 14 at AGFC292 (Clearwater Lake Environmental Assessment).

However, by the late 1990s, as deviations continued, the Corps of Engineers had been repeatedly warned by members of the Commission that the ongoing deviations were causing flooding in the Management Area that could potentially damage the bottomland hardwood trees owned by the Commission. *See, e.g.*, PX 266 at AGFC7657-58 (Mem. from Zachary to Akers). In its participation in the Black River subcommittee meetings, the Commission informed Mr. Hendricks, the Corps' representative, that the "Management Area was experiencing flooding during the growing season," and the Commission expressed its belief "that the deviations from the original authorized plan [were] the primary cause for that type [of] flooding." Tr. 84:1-4 (Zachary). In March 1996, Mr. Hendricks was copied on a letter indicating that the Commission had informed the Corps that it "supported evacuation of the flood pool as quick[ly] as possible to eliminate higher May and June flows which were damaging the bottomland hardwoods." JX 223 at US1603 (Letter from Gary T. Christoff, Policy Coordinator of the Missouri Department of Conservation, to Earl T. Smith, Arkansas Soil & Water Conservation Commission (Mar. 19, 1996)). Then in September 1996, the Commission expressed further concern that "the deviations from the authorized plan of operation of Clearwater Lake w[ere] the direct cause of the growing season flooding and incurred damages on the [Management Area]." Tr. 105:1-7 (Zachary) (citing PX 262 (Letter from Mike Armstrong to Gary Christoff (Sept. 6, 1996))). Mr. Zachary testified that Mr. Christoff, the moderator of the Black River

subcommittee meetings, was "concerned with the welfare of the bottomland hardwood forest along the basis [that they] were being affected by the growing season flooding." Tr. 107:8-11 (Zachary).

By March 2001, after acknowledging that "[t]he flooding is more extensive than our modeling predicted and the duration is probably more," Colonel Holden stated that "anyone could challenge us in that deviations are not in compliance with NEPA and enjoin us. Blissful ignorance of the preceding 25+ years no longer applies." PX 632 at US477 (Letter from Col. Holden (Mar. 30, 2001)); *see* Tr. 233:20 to 234:18 (Hicklin). Accordingly, although the Corps was not aware and not on actual notice in 1993 that its deviations from the water control plan would result in damage to the timber in the Management Area, if it had performed a reasonable investigation of the effects the deviations would have on downstream water levels, it would have been able to predict both that the deviations would increase the levels of the Black River in the Management Area and that the flooding caused by these increased levels would damage timber in the Management Area. Indeed, the Corps had available to it a computerized modeling system that could have been used to evaluate potential hydrological effects of its deviations from the water control plan, *see* Tr. 2927:21 to 2928:14 (Raible); DX 310 at 15 (Nutter Report), but that model was not employed until well after the deviations had ceased – indeed, not until the Corps' staff and the government's experts were preparing for trial in this case. *See* DX 310 at 15 (Nutter Report). In short, the effect of deviations in the Management Area was predictable, using readily available resources and hydrologic skills.

2. No intervening cause.

Tangentially related to predictability, the government contends that the damage to oak trees in the Management Area was not due solely to flooding during growing seasons attributable to the Corps' deviations, but instead "depended on other conditions, which no one could have predicted." Cl. Tr. 34:2-5. Primary among these "other conditions" were the summer droughts in 1999 and 2000, which the government claims represented a "naturally occurring intervening event that breaks the causal chain between the Corps' actions and the timber mortality." Def.'s Post-Trial Br. at 9. Citing Dr. Baker's testimony that the drought "was kind of the thing that tilted the scale," Tr. 2437:22-23 (Baker), the government identifies the summer drought from 1999 to 2000 as an intervening cause that breaks the link between the increased flooding probability and the damage to the trees. Cl. Tr. 34:25 to 35:4. The government acknowledges Dr. Baker's testimony that the root systems of trees in portions of the Management Area were severely damaged by flooding during consecutive growing seasons, but argues that it was the drought itself "that caused the massive, the devastating mortality" claimed by the Commission. Cl. Tr. 37:15-17.

Conceptually, an intervening or contributing cause can break the chain of foreseeable causation, although the existence of an "incidental intervening or contributing cause between [the government's] authorized action and the alleged injury" does not necessarily preclude a finding of foreseeability. *Cary*, 552 F.3d at 1379. "Wherever there is an authorized action, the causation prong is satisfied for any injury

which is the direct, natural, and probable result of that action." *Id.* In *Cary*, a recent decision where the invasion of a property interest was found not to be foreseeable, the Federal Circuit offered the following contrasting hypothetical:

> [H]ad the government action been to accumulate fuel loads in the [fire zone], even without knowledge that such fuel loads would become a large conflagration upon any ignition, then any ignition, even one negligently started by unauthorized human hands, would be adequate for that government act to satisfy the causation prong. This is because an ignition is the direct, natural and probable result of the government intentionally allowing fuel loads to accumulate in a fire zone, and a conflagration is the direct, natural, and probable result of this ignition in a forest with high fuel loads.

552 F.3d at 1379 (holding that the government "did not need to light the match to be liable, but to be a taking, it must have at least authorized supplying the fuel").

In the present situation, the decision to deviate from the water control plan from 1993 to 2000 was certainly an authorized act. Consequently, the question before this court is whether there was a "direct, natural, and probable path[]" between the authorized act of releasing additional water and the flooding of the Management Area, or whether this authorized act was only "converted into a damaging event" due to the presence of an intervening cause. *Cary*, 552 F.3d at 1379. It is evident that here there was a "direct, natural, and probable path[]." *Id.* The drought may have been a contributing factor to timber

mortality, and even a necessary factor to the catastrophic losses that occurred in 1999 and 2000, but as Dr. Baker and Dr. King testified at trial, the root systems of bottomland hardwood trees in the Management Area had already been severely damaged by excess inundation during the growing seasons from 1993 to 1999, thus rendering them more susceptible to drought than they would have been otherwise. *See supra*, at 17-18. The fact that trees in control stands suffered no harm from the 1999 and 2000 drought indicates that the distinguishing factor that engendered mortality of trees that had been regularly inundated was the damage that had occurred to their root systems during the years of growing season flooding from 1993 to 1999. *See* Tr. 2444:10-14 (Baker); *see also* Tr. 2444:5-9 (Baker) (ascribing trees' inability to survive the drought to the fact that they had already "lost half of their root systems or more" due to consecutive years of summertime flooding); Tr. 3359:25 to 3360:3 (King) ("I think any of the trees that were really stressed from the flooding during that period would -- a lot of them would have been pushed over the edge with the drought.").

Because the government set this chain of events into motion through authorized deviations from the water control plan, the fact that there was some later incident that may have "tilted the scale," Tr. 2437:22-23 (Baker), or "li[t] the match," *Cary*, 552 F.3d at 1379, does not break the chain of foreseeable results of the government's authorized action.

D. Measure of Damages Based on Taking of Timber

The Supreme Court permits recovery based on temporary takings. After reviewing relevant

precedents on this point, the Supreme Court stated that "[t]hough the takings were in fact 'temporary,' . . . there was no question that compensation would be required for the government's interference with the use of the property. *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304, 318 (1987) (summarizing the decisions in *Kimball Laundry Co. v. United States*, 338 U.S. 1, 4-21 (1949); *United States v. Petty Motor Co.*, 327 U.S. 372, 377-81 (1946); and *United States v. General Motors Corp.*, 323 U.S. 373, 379-384 (1945)). In this range of temporary takings cases, the Supreme Court "was concerned in each case with determining the proper measure of the monetary relief to which the property holders were entitled." *First English Evangelical Lutheran Church*, 482 U.S. at 318.

The Commission's theory of recovery is not based on a temporary appropriation of a flowage easement, likely in deference to the Federal Circuit's decision in *Cooper*, which measured compensation in terms of timber destroyed. 827 F.2d at 763-64. Indeed, here, as in *Cooper*, the flowage easement was not taken on a permanent basis. 827 F.2d at 762-63.[19] Instead, the court will assess the government's acquisition of the flowage easement as a predicate closely attendant to

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[19] In concert with *Kimball Laundry*, *Petty Motor*, and *General Motors*, *Cooper* serves as a guiding precedent for "determining the proper measure of the monetary relief to which the property holder[] [subject to a temporary taking] [is] entitled." *First English Evangelical Lutheran Church*, 482 U.S. at 318. *See Huntleigh USA Corp. v. United States*, 525 F.3d 1370, 1382 n.3 (Fed. Cir. 2008) (commenting on *Kimball Laundry* and *Cooper* as precedents for different measures of damages for "a temporary, not a permanent, taking").

the Commission's property interest in timber. In effect, the temporary taking of a flowage easement resulted in a permanent taking of timber and thus timber value serves best as the measure of monetary relief to which the Commission is entitled.

II. Causation

The conclusion that an injury caused by governmental action was foreseeable "does not mean that issues surrounding causation are irrelevant. On the contrary, causation must be shown." *Moden*, 404 F.3d at 1343 (citations omitted). In proving causation, "[i]t is well established that a taking occurs when a government action causes groundwater levels to rise and destroy surface agricultural use." *Alost v. United States*, 73 Fed. Cl. 480, 506 (2006) (citations omitted). However, the Commission, as plaintiff, must demonstrate that the government's actions were "the direct and proximate cause" of the harms to its property interest. *See Loesch*, 645 F.2d at 913.

In this case, two sets of causal premises must be established by the Commission. First, the Commission must show that the Corps' deviations from the authorized water control plan caused increased flooding in the Management Area, and second, that this flooding caused significant damage to bottomland hardwood timber in the Management Area. Additionally, as the government points out, two causal links are embedded within this first set of premises: the Commission must prove both that the Corps' deviations resulted in increased levels of the Black River as compared to historical averages and that the increased river levels resulted in increased flooding in the Management Area. *See* Cl. Tr. 51:16-24.

Regarding the first of these causal links, the government contends that the Management Area "would have flooded even if the Corps had not deviated from 1993-2000." Def.'s Post-Trial Br. at 15. Regarding the second causal link, the government argues that the Commission "failed to present any reliable or meaningful evidence about how the 1993-2000 deviations actually impacted timber on the [Management Area]." *Id.* Finally, in critiquing the alleged link between the flooding caused by the Corps and the damage to timber in the Management Area, the government resists reliance on the Commission's use of post-1999 mortality rates obtained from the Kingwood cruises to prove that the deviations were the cause of the increased timber mortality. *Id.* at 35. As a corollary to this final critique, the government additionally argues that the timber in the Management Area was not completely damaged, contending that flooding during the years of the deviations "narrowed, but did not prevent, [the Commission's] ability to conduct 'forestry work like timber inventories, [and] timber markings for timber sale activities.'" *Id.* at 34 (quoting Tr. 1236:18 to 1237:5 (Hausman)).

A. Water Levels on the Black River

The water gauges in place at various points along the Black River indicate water levels of the Black River before, during, and after the period of the Corps' deviations. *See e.g.*, JX 266 (Corning Gauge Data); DX310 at 15 (Nutter Report). The water gauge immediately upstream from the Management Area in Corning is particularly useful in this regard, because it gives a daily snapshot of the breadth and depth of water coverage relatively close to the Management

Area. Based on these and other data, the Commission and the government "agree that the [Corps of Engineers'] deviations between 1993 and 2000 impacted Black River [water] levels." Def.'s Post-Trial Br. at 15. The parties also agree that the Management Area has experienced varying degrees of seasonal flooding since its inception; the Commission recognizes such flooding to be "'a dominant feature of the hydrology that controls the habitat community structure of the Black River floodplain in the [Management Area] region.'" Pl.'s Reply at 15 (quoting PX 500 at 11 (Heitmeyer Report)). Where the parties differ in their analysis of water level data is both in their characterization of the frequency of growing season flooding from 1993 to 1999 when compared with earlier time periods, and in their description of the particular pattern of growing season flooding that emerged from 1993 to 1999.

The government cites to Dr. Overton's comparison of water gauge data from 1981-1992 with data from 1993-1999, and argues that this comparison indicates that "there were periods before 1993, before the deviations, . . . when the Black River was 'high.'" Cl. Tr. 53:3-11 (discussing PX 506 at Figure 3 (Overton Report)). From this factual premise, the government argues that the flooding events during the mid- to late-1990s were thus not out of the ordinary. Cl. Tr. 53:3-11. Dr. Overton's comparison of the two time periods indicates that the Black River reached certain ranges of heights either as frequently, or more frequently, during the period from 1981 to 1992 than during the period from 1993 to 1999. *See* Def.'s Post-Trial Br. at 23 (citing PX 506 at Table 2 (Overton Report) (finding that there were more days from 1981 to 1992 when the Corning gauge reached levels of 5 to

6 feet, 6 to 8 feet, and 10.5 to 11.5 feet). Yet under the comparison of water gauge data offered by the government, the Black River reached a height of 8 to 10.5 feet for an average of just 24.58 days during the April-to-October growing seasons from 1981 to 1992, versus 46.58 days from 1993 to 1999. PX 506 at Table 2 (Overton Report). The government also acknowledges that when compared to the period from 1981 to 1992, the Corning gauge exceeded five feet for a seasonal average of approximately 8.5 additional days during the growing seasons from 1993 to 1999. *See* Def.'s Br. at 23 (citing PX 506 at Table 2 (Overton Report)). Furthermore, a broader comparison between the growing seasons from 1949 to 1992 and the growing seasons from 1993 to 1999 indicates that the water level reached five feet for a seasonal average of over 26 days more during the latter period, and the water level reached six feet for a seasonal average of nearly 29 days more during the latter period. PX 500 at 13 (Heitmeyer Report) (Table 3). The simplest conclusion to draw from these varied analyses of the frequency of growing-season water levels is that the Black River experienced more high water during the growing seasons from 1993 to 1999, *i.e.*, the period of years during which the Corps of Engineers deviated from the authorized water control plan, than it experienced during previous time periods.

B. Increased Flooding of the Management Area

Additionally, in the context of the historical flooding patterns, the particular pattern of flooding and high water levels recorded in the Management Area from 1993 to 2000 stands out as unique. During 1993 to 2000, the Management Area experienced six consecutive years of growing-season flooding, with

water levels in excess of five feet for at least 65 days during each year; in 1997, the river level exceeded five feet for 166 days. PX 500 at 14 (Heitmeyer Report) (figure 10); JX 266 (Corning Gauge Data). Such a sustained period of consecutive years of growing-season flooding was unprecedented. Tr. 2781:17-20 (Heitmeyer).[20] In "normal" years, the Black River would rise rapidly during rain events and then fall rapidly. *See supra*, at 11.

Consequently, in addition to the increase in the number of days of flooding from 1993 to 2000, the Commission contends that "the flooding observed during the period was to a greater extent and duration than had previously been the case under the authorized plan." Cl. Tr. 6:20-22. This contention is verified by the letter from Colonel Holden, stating from the perspective of the Corps that "[t]he flooding is more extensive than our modeling predicted and the duration is probably more." PX 632 at US476 (Letter from Col. Holden).

To these proofs of the increased frequency and duration of flooding, the government responds that even if the Black River reached higher levels during the period of the Corps' deviations, the Commission "presented no evidence correlating river stages with flooding on particular portions of the [Management Area]; describing how much water floods the [Management Area] at particular river stages; explaining how many trees are impacted by particular

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[20] The cumulative impact of six years of growing-season flooding was crucial, as will be explained below, to the decline of the root structure of timber in the Management Area. *See infra*, at __.

river stages; . . . showing how long any portion of the [Management Area] stays flooded[;] . . . [or establishing] what areas on the [Management Area] drain at specific river stages." Def.'s Post-Trial Br. at 16. Because the Management Area is heterogeneous, and is comprised of different areas with different populations of trees and different mortality rates, the government argues that the Commission was required to present more than "*general* beliefs that the [Management Area] begins to flood, or begins to drain at certain river levels." Cl. Tr. 56:21-23 (emphasis added). Rather, to account for the significant variation between mortality rates in different parts of the Management Area, the government argues that the Commission should have presented specific evidence concerning the particular river stages at which particular areas in the Management Area begin to flood. Cl. Tr. 56:24 to 57:6.

The government acknowledges that the Commission compiled specific evidence concerning the river level at which the Upper Island GTR floods, but notes that timber mortality was actually lower at Upper Island than elsewhere in the Management Area. Cl. Tr. 57:15 to 58:22. More particularized evidence of this sort, suggests the government, would have enabled the court to perform "specific assessment[s] as to whether the high timber mortality corresponded to the flooding and draining" of certain areas. Cl. Tr. 57:1-6. The government cites Dr. Nutter's testimony at trial for the broad argument that the "'lack of specific elevational information within [the Management Area]' rendered meaningless [p]laintiff's imprecise assertions about river stages." Def.'s Post-Trial Br. at 16 (quoting Tr. 3054:16-17 (Nutter)). However, this contention is unavailing.

The Commission adduced reliable evidence from a variety of sources, including data from foresters who had worked in the Management Area for long periods of time and records kept to accommodate duck hunters, that the Management Area begins to flood when water levels at the Corning gauge reach a range of 4.5 to 5 feet, and that there is extensive flooding when the water level reaches six feet at the Corning gauge. *See, e.g.*, Tr. 74:1-3 (Zachary); Tr. 2825:21 to 2826:1 (Heitmeyer) (stating that although there is "not just one point, one level at which [water] enters the woods," water "enters at least some parts of the floodplain as low as 4.5 [feet]"); PX 436 at 10779, 10797 (photographs indicating flooding in the Management Area when the Corning gauge was at 5.03 feet (Apr. 17-22, 2001)); Tr. 2787:10 to 2789:3 (Heitmeyer) (indicating range of evidence relied upon in determining flooding levels); *see also* Tr. 3056:9-13 (Nutter) (acknowledging that flooding would occur when the water level at the Corning gauge was between 4.5 and 6 feet). Such evidence also indicated that the water does not drain from the Management Area until the Black River falls below a level of 4.5 feet at the Corning gauge. *See* Tr. 73:16-22 (Zachary). In addition, proofs at trial showed that soil saturation and flooding of timber root zones can persist even after surface flooding has ceased. Mr. Baker testified that "once the water was released, it still takes those soils sometimes three or four weeks to actually dry out, to dry to the point that they are not saturated." Tr. 2341:10-13 (Baker); *see* Cl. Tr. 114:23-24 (government acknowledging that after a flooding event "it takes four to five weeks for the [Management Area] to drain down below the root[s]"). Finally, Dr. Heitmeyer testified and indicated in his report that when the Corning gauge "is five feet, [water] floods greater than 30

percent of the nuttall oaks on the [Management Area], and [at] a six-feet reading[,] over 50 percent of the nuttall [oaks] were flooded." Tr. 2805:6-9 (Heitmeyer); PX 500 at 30 (Heitmeyer Report).

The Commission thus argues that it "presented substantial and convincing evidence that the [Management Area] suffered significant additional flooding as a direct, natural[,] and foreseeable result of the Corps' deviations." Pl.'s Reply at 15. Perhaps the most dramatic evidence in this regard came from the testimony of one of the government's own experts, Dr. King, who acknowledged that "[t]he Corps' deviations resulted in substantial additional flooding on the [Management Area]" and that "[t]he deviations caused flooding that covered more surface on the [Management Area] than . . . would have been covered under the original plan." Tr. 3367:10-14, 3367:22 to 3368:2 (King). Dr. King also agreed that at times, "[t]he Corps' deviations caused flooding that lasted longer than would have occurred under the original, authorized plan." Tr. 3368:3-6 (King).

However, the government objects to the causal link between the Corps' deviations and the flooding based on its use of its river-basin model to analyze what would have happened to water levels on the Black River from 1993 to 2000 had the Corps not implemented its deviations to the authorized water control plan. Based on results from this model, the government argues that

> if one accepts [p]laintiff's assumptions that extensive flooding occurs when the Corning gauge reaches 4.5 feet, that the surface remains flooded until the Corning gauge falls below 4

> feet, and that [bottomland hardwood] roots remain saturated until the Corning stage falls below 3 feet, the SUPER model shows that trees on the [Management Area] would have been significantly inundated even without the deviations.

Def.'s Post-Trial Br. at 28. The model predicted that the river level in the Management Area would have reached at least 5.5 feet for over 72 percent of the days during the growing seasons from 1994 to 1999, and that the growing seasons with the most flooding would have been those from 1994 to 1996. Tr. 3358:4-7, 3361:12-20 (King). From this application of the model, the government concludes that "there would have been significant periods of timber inundation" even in the absence of the Corps' deviations. Def.'s Post-Trial Br. at 30.

The government's objection, however, is unpersuasive given the problems that were identified with the government's modeling and comparison of the growing seasons from 1993 to 2000. First, the reliability of the model is far from unassailable. Certainly, "it would be unreasonable to conclude that the subject of scientific testimony must be known to a certainty." *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 590 (1993) (internal quotation and citations omitted); *see also Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 152 (1999) (clarifying the standard set forth in *Daubert* for admission of expert evidence as requiring "the same level of intellectual rigor that characterizes the practice of an expert in the relevant field"). However, the fact that the model was "very reliable and more accurate than [other] simulation models" and offered output that was "far better than

what you would typically expect" from river modeling, Tr. 3064:22 to 3065:8 (Nutter), does not indicate that results from its use should be employed to displace actual observations. *See* Tr. 2956:7-22 (Raible) (noting that the model was never calibrated to actual observed data from the Corning gauge).

Second, the government engages in a faulty assumption regarding drainage levels of the Management Area when it compares the number of days at which the model and the actual Corning gauge readings measured water levels at three feet. *See* Def.'s Post-Trial Br. at 28. Although the government contends that plaintiff has assumed that "[bottomland hardwood] roots remain saturated until the Corning stage falls below 3 feet," Def.'s Post-Trial Br. at 28, the Commission rejects this attribution of such an assumption, pointing out that "effective groundwater drainage will only occur once the surface begins to be dewatered[,] [which] occurs between 4.5 and 5 feet at Corning." Pl.'s Reply at 17. The Commission is correct on this point: testimony indicates that drainage begins to occur once water is cleared from the surface, which occurs when water levels are between 4.5 and 5 feet at the Corning gauge. *See supra*, at 9-12. It is true that the roots on bottomland hardwood trees can extend approximately twenty-four inches below the surface, Tr. 2391:18-25 (Baker), but this fact does not imply that these roots will remain saturated until the water level at the Corning gauge is a full twenty-four inches below the five-foot level at which groundwater begins to drain. The government's comparison of days at which the model and the Corning gauge reached three feet is thus irrelevant to any determination of how frequently root-system flooding would have occurred in the real versus the modeled world. A more practical

comparison, based on how frequently the model and the Corning gauge reached a level of *five* feet, indicates that there would have been a total additional 123 days of growing-season flooding at the five-foot stage at Corning during the period of deviations from 1993 to 2000. *See* PX 492 (Comparison of Corning Observed and Model Data from 1993 to 2000).

Accordingly, based on the increased frequency and uniquely sustained pattern of flooding in the Management Area during growing seasons in the years from 1993 to 2000, which would not have occurred in the absence of the Corps of Engineers' deviations, the court finds that the Commission has successful demonstrated that the Corps' deviations from the authorized water control plan resulted in increased flooding in the Management Area.

C. Effect on Oak Trees

The next question in the chain of causation, then, is whether the Commission established that the increased flooding caused by the Corps of Engineers' deviations was the actual and proximate cause of increased damage to bottomland hardwood timber in the Management Area. There are, again, two causal premises embedded within this inquiry. The first is whether the mortality rate of bottomland hardwood timber in the Management Area actually increased from its normal background mortality rate. The second question is whether the flooding caused by the Corps of Engineers was the cause of this increase in mortality.

1. Increased mortality.

The Commission argues that an increase in damage to bottomland hardwood timber in the Management Area can be demonstrated through a comparison of mortality rates before and after the period of the Corps' deviations. The Commission argues that "[t]he mortality observed and measured by Kingwood in 2000 and 2001 was clearly in excess of normal . . . background mortality." Cl. Tr. 7:18-20. The Commission averred that the normal background mortality rate was in the range of 0.5 to 2%, based on the testimony of Dr. Baker, Dr. King, and Mr. Foster, *see* Pl.'s Reply at 27, and that the post-deviation mortality rate was in the range of 3 to 19.5%, based on Kingwood's evaluation. *Id.* at 20. Because the mortality rate reported by Kingwood was "greatly in excess" of the normal background rate, *id.* at 27, the Commission argues that the Management Area experienced an increase in mortality after the period of the Corps of Engineers' deviations from the authorized water control plan.

The government resists the Commission's claim that an increase of timber mortality can be proven through this comparison of mortality rates. First, the government argues that the Commission engaged in an "apples-to-oranges comparison" by "compar[ing] mortality rates on different areas at different times" rather than measuring mortality rates on the same portions of the Management Area across different times. Cl. Tr. 60:10-20. Due to the somewhat different composition of the tree stands in the Management Area, varying by elevations and site conditions, the government contends that "the only legitimate comparison of pre- and post-deviation mortality rates

must focus on the exact same geographic area." Def.'s Post-Trial Br. at 35-36. The government also criticizes the high confidence intervals present in the Kingwood studies. Cl. Tr. 66:18-20.

Although the Commission did not perform periodic forest inventories that would have enabled the measurement of mortality rates on the same areas at different times, the Commission did, through Kingwood, perform two cruises of the Management Area, which resulted in a thorough assessment of 18,623 acres, or roughly 75 percent, of the entire Management Area. *See* PX 80 at 15 (Kingwood Report I) (addressing 6,990 acres); PX 79 at 4 (Kingwood Report II) (addressing 11,633 acres); *see infra*, at 46-48. The type of cruise design employed by Kingwood is "generally accepted in the forestry industry." Tr. 1942:6-11 (Livingston). In addition, through the use of control areas which were not subject to increased inundation, the Commission was able to provide a fair approximation of the differential between areas that were and were not subject to increased growing-season flooding during the 1990s. *See* Tr. 2432:7-10 (Baker) (stating the "two control stands . . . averaged [0].13 percent" annual mortality); PX 485 at AGFC11549 (Kingwood Report of Hardwoods in Black River Wildlife Management Area) (finding a per-acre average of zero dead red oaks and less than one declining red oak in the control stands).[21] On this point, Dr. Baker testified that when one

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[21] The government objects that these were not appropriate control areas because they were primarily upland areas that "don't ever flood," Cl. Tr. 62:10-14, but that in fact was the purpose of establishing control areas: to provide a comparison of mortality on areas that did flood with those that did not.

examined the control stands, one would find that they "were not flooded. There was no mortality in them. They went through the same drought [in 1999 and 2000], but there was not a damaged root system there, and they didn't die." Tr. 2444:10-14 (Baker). Accordingly, the Kingwood studies were sufficiently rigorous to result in a reasonable assessment of changing mortality rates in the Management Area.

The government's objection to high confidence intervals present for single sample plots in the Kingwood studies is equally unavailing, given that high confidence intervals are a common statistical artifact of the small individual sample sizes employed in the studies, *see* Tr. 2219:3-16 (Foster) (explaining that the average sample size in the second Kingwood study area was 150 sample plots), and thus should not be treated with suspicion. When aggregated into a single study, as occurred here, these confidence intervals dropped significantly. *See* Tr. 2219:22 to 2220:1 (Foster) ("As our sample gets bigger and goes up to the 1,400 sample plots for the whole, then we have a very much more credible estimate.").

Relatedly, the government argues that in actually compiling the post-deviation mortality rate for the Management Area, the Commission erred by conducting the Kingwood study "on areas of highest mortality . . . [and] on areas with significant preexisting conditions." Cl. Tr. 65:23 to 66:1. The government contends that a large portion of the Kingwood study mapped "areas of high risk, poor hardwood reproduction, significant water stress, significant timber mortality, and a change to more water-tolerant species." Def.'s Post-Trial Br. at 44. Such a comparison, suggests the government,

"guarantees a high differential because the Kingwood cruisers collected data only from high mortality areas, while the 'normal' background mortality rate is based on data from a more heterogeneous (though hypothetical) [bottomland hardwood] forest." *Id.* at 43.

However, although regions with pre-existing conditions certainly existed in the Management Area at the time of the Kingwood study, *see* DX 334 (Map of Management Area shaded by Mr. Hausman to indicate areas with pre-existing problems), there is no strong indication that these conditions actually resulted in significant timber mortality. Dr. King did attest that in "trying to piece together what . . . the [Management Area] look[ed] like prior to the deviation period, . . . there were numerous documents that spoke about drainage problems or beaver damage or presence of beaver within those sites, and bottomland hardwoods being flooded." Tr. 3354:18-23 (King). But these problems regarding drainage, beaver dams, insect infestations, and other conditions were established to be insignificant in the context of the larger mortality caused by flooding in the Management Area. *See* Tr. 2389:18-24, 2434:3 to 2437:21 (Baker).

Separately, the government spends a detailed portion of its post-trial brief arguing that the background timber mortality rates offered by the Commission and its experts are irrelevant to the actual history of mortality in the Management Area and unsupported by other research data about the Management Area. Def.'s Post-Trial Br. at 36-41. The government argues that "there is no basis to conclude that the pre-1993 mortality rate on the [Management Area] bears any resemblance to mortality rates on other properties." *Id.* at 37 (citing Tr. 3530:19 to

3531:3 (Test. of Dr. Steven Burak, President of Sizemore & Sizemore, Inc., who appraised the value of the Commission's timber interest as an expert for the government)). The government suggests that Dr. Baker and Mr. Foster "speculated about a mortality rate one might expect on some imaginary [Management Area]." *Id.* at 36. As a result of these alleged problems with the Commission's establishment of a background timber mortality rate, there is, the government suggests, "no evidence before the [c]ourt about what an actual normal mortality rate is for this [Management Area]." Cl. Tr. 64:10-12.

However, the evidence presented by the Commission regarding the history of mortality in the Management Area indicates that a forest that was once "in very healthy condition . . . [with] no obvious signs of sickness or problems with the forest's health," Tr. 60:18 to 61:4 (Zachary) (regarding forest condition in 1978); *see also* Tr. 1190:20 to 1191:6 (Hausman) (describing his amazement at the size and population of nuttall oak trees in the Management Area in the early 1980s); Tr. 613:20-24 (Blaney) ("[I]t was the most beautiful intact bottomland hardwood forest that I've ever seen . . . . All the trees were so large and healthy."), degraded rapidly during the 1990s. Although areas of the forest containing nuttall oaks were intact in 1994, Tr. 628:25 to 629:5 (Blaney), the Commission first began to observe stress in approximately 1993, "particularly [in the areas] that were flooded during the growing season." Tr. 61:9-14 (Zachary). Mr. Foster testified that by 2000, the Management Area was experiencing "excessive mortality of nearly catastrophic proportions" on the first area studied by Kingwood, and "excessive or elevated mortality" in the second Kingwood study

area. Tr. 2240:19-24 (Foster). Mr. Foster and Dr. Baker agreed that the ecosystem was in a state of collapse. Tr. 2080:21-23 (Foster) ("[W]e were looking at the early stages of an ecosystem collapse for this bottomland hardwood ecosystem."); Tr. 2400:2-7 (Baker) ("It was a bottom-land hardwood ecosystem in a state of collapse. Most of the nuttall oak, most of the red oaks were dead or dying. Many of the white oaks were dead or dying. Most of the sweetgum were dead or dying, and they were being replaced by wetland species in the understory."). Dr. Baker testified that in comparison, in a healthy, bottomland hardwood stand, he would "expect to see one dead tree maybe every five or ten acres . . ., maybe four dead trees in a 40-acre block. Probably two of those would be lightning strike, and two of them would be wind throw." Tr. 2374:18-23 (Baker). Such observations add depth and context to the background mortality rate proffered by the Commission. *See also* PX 53A-N (aerial photographs taken in April 2000, showing large numbers of dead trees).[22]

The government's description of plaintiff's expert evidence concerning mortality rates as "contradictory and biased" is baseless, given that many of these expert estimates fall consistently within a general range of 0.5 to 2 percent. *See, e.g.*, PX 504 at 3 (Submission of Supplemental Information to Kingwood I by Dr. Baker (Apr. 11, 2008)) (citing a background mortality rate of one to two percent); PX 505 at 2 (Supplement to Kingwood Report I) (citing a background rate of 0.75% in GTRs and 0.5% in other

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[22] Questions about the particular background mortality rates are addressed in the damages section, below. *See infra*, at 49.

areas). There is no reason to suspect that Dr. Baker and Mr. Foster engaged in what the government describes as "obvious coordination of their testimony." Def.'s Post-Trial Br. at 38. Dr. Baker did put forward a lower rate of background mortality at trial, *see* Tr. 2430:1-21 (Baker), although that rate remained within the range established by prior reports and testimony. He testified that he came to this new conclusion "after doing some additional study, investigation, looking at publications, [and] looking at data." Tr. 2521:5-9 (Baker). The opinions are reliable and not marred by bias.

As to the government's argument that the background mortality rate was purely speculative, Dr. Baker did acknowledge that "background mortality is kind of an average because background mortality is going to be a little bit different on different stands, different sites, different land forms, [and] different plant communities," Tr. 2429:12-16 (Baker), but this acknowledgment of variation and heterogeneity is not a sufficient reason to discard the Commission's estimate of mortality. Dr. Baker's estimate was not based on speculation; rather, he relied upon "experience with stand situations similar to what's growing on the [Management Area], with the green tree reservoirs associated here" to develop a mortality rate that would fairly represent an overall cross-section of such situations. *See* Tr. 2429:21 to 2430:1 (Baker). In developing his conclusion, Dr. Baker justifiably relied on a variety of inventories and research studies that had been performed in the Management Area and other similarly situated forests. *See* Tr. 2431:7 to 2432:17 (Baker); PX 504 (Submission of Supplemental Information to Kingwood I by Dr. Baker).

Consequently, the court finds that the Commission's sampling methodology and evidence of general background mortality withstand the government's objections and serve as persuasive proofs of increased mortality resulting from increased inundation of parts of the Management Area during growing seasons from 1993 to 2000.

2. *Causal links between die-back of feeder roots due to flooding and subsequent mortality.*

As to the second causal premise, the government contends that even if the Commission successfully demonstrated that there was an increase in flooding in the Management Area during the growing seasons from 1993 to 2000, it "failed to present any meaningful data about the relationship between the flooding and draining amount from the [Management Area] and timber health." Cl. Tr. 56:13-15. The government suggests that the Commission, as a matter of logic, has "confuse[d] sequence with causation" in its use of a mortality rate from 2000 to conclude that the cause of this elevated mortality rate must have been the deviations. Cl. Tr. 59:16-24.

However, the Commission's causal argument in this regard does not rely on a mere correlative conjecture that the presence of higher mortality after 2000 indicates that the Corps' deviations were the cause of the increase in mortality. Rather, the Commission has offered significant and persuasive evidence drawing links between the Corps' deviations and the die-back of feeder roots, the consequence for trees during the moderate drought of 1999 and 2000 of the die-back of feeder roots, and the resulting catastrophic mortality in the sections of the

Management Area that were subject to flooding and saturated soils during the growing seasons from 1993 to 2000.

The cumulative impact of six years of growing-season flooding was crucial, according to many sources, to the decline of the root structure of timber in the Management Area. *See, e.g.*, PX 575 at US34 (Corps' News Release) (stating that testing by the Corps "confirm[ed] that significant amounts of tree roots were flooded and could, under certain conditions, remain flooded long enough to damage or destroy the trees at the regulating stages under the new plan"). Dr. King, a witness for the government, testified that

> as Dr. Baker pointed out, one of the most important factors that begins to happen under these flooded -- prolonged flooded conditions is the roots begin to die, and it can begin to affect their ability to pull in nutrients, and water, and be able to photosynthesize. And so you wind up with degradation of the tree crown, and it also can make them susceptible to drought in the future if they lose enough of those roots.

Tr. 3345:2-11 (King).

In ascribing the degradation of timber stands to the Corps' decision to deviate from the authorized water control plan, the Kingwood study noted that "[e]ven though the oak forests that exist in the Black River flood plain are tolerant of dormant season flooding and wet soils, they cannot tolerate repeated growing season floods and saturated soils." PX 80 at 9 (Kingwood Report I). The Kingwood study stated that "prolonged growing season flooding . . . undoubtedly

resulted in saturated soils, inadequate oxygen levels in the water and the soil, increased root respiration, and significant root mortality and die-back in many of the less water tolerant trees such as [n]uttall oak and sweetgum." *Id.*

In turn, the trees that had suffered die back of feeder roots were not able to withstand the drought of 1999 to 2000. Dr. Baker testified that "if [the trees] had not . . . been subjected to the flooding and lost half of their root systems or more, they would have survived that drought very easily." Tr. 2444:7-9 (Baker). As it happened, the drought following the years of increased inundation during the growing seasons led to the death and injury of trees that was dramatically higher than would have occurred in normal conditions. *See supra*, at 17-18. This chain of causation followed Dr. King's formulation that "if you have a really wet period and then you follow by a severe drought, it can lead to acute mortality because of the fact that the trees have lost a lot of their smaller feeder roots, . . . and they just simply can't pull in the resources necessary to sustain them." Tr. 3345:15-20 (King).

In short, evidence put forward by the Commission and admissions by the Corps of Engineers indicate the significant impact of flooding on the bottomland hardwood timber in the Management Area. The parts of the Management Area that were subject to saturated soils during the growing seasons from 1993 to 2000 suffered catastrophic mortality and loss. The Corps acknowledged the dangers of the flooding when Colonel Holden wrote that the Corps was "not able to continue moving the proposed 4-[foot] seasonal Clearwater Lake deviation. Our regulating stage is at

Poplar Bluff and under this deviation we extend the duration of lower releases from Clearwater Lake which has significant impacts to the bottomland hardwoods in the Donaldson/Black River Wildlife Management Area." PX 632 at US476 (Letter from Col. Holden). Later in that same memo, Colonel Holden noted that "[the Commission] has objected in the past because they contend that we increase the flood duration of hardwoods and kill more trees this way, particularly during the growing season. They now have a study that shows this *and we acknowledge the validity of their concerns.*" *Id.* (emphasis added). At a later public meeting of the Corps of Engineers, in April 2001, Colonel Holden stated that the Corps found it unacceptable to adopt the proposed deviation plan on a permanent basis "because of the clear potential for damage to bottomland hardwoods in the Dave Donaldson Black River Wildlife Management Area." PX 576 at US39 (Colonel Holden's Remarks to the Black River Operations Public Meetings). The evidence in the record supports Dr. Baker's opinion that "[t]he cause [of tree mortality and decline] was some severe physiological problems resulting from four or five successive years of summertime flooding, particularly during the hot summer months when anaerobic water and soil conditions developed in these stands." Tr. 2433:24 to 2434:7 (Baker).

Further evidence of the causal relationship between flooding and increased mortality is provided by the lack of such increased mortality at higher elevations in the Management Area. Because these higher elevations were not subject to the same degree of growing-season flooding during the period of the Corps' deviations, they provide a control stand by which to compare the mortality of trees that were and were not

directly subjected to the effects of the Corps' deviations from the water control plan. Tree stands at the higher elevations, which were never flooded from 1993 to 2000, *see* Tr. 2506:24 to 2507:3 (Baker), were in markedly better condition than those at lower elevations. *See* Tr. 2445:19-23, 2446:7-8 (Baker).

D. Alternative Causes

Finally, the government argues that even if the Commission can show an increase in mortality due to the deviations at the Clearwater Dam, "that would not prove that the deviations, as opposed to some other event, the naturally occurring flooding or the naturally occurring flooding plus the drought, might have caused the damage that [p]laintiff now complains about." Cl. Tr. 59:18-24. The government contends that the flooding was not predictable solely on the basis of the Corps of Engineers' deviations, and instead "depended on other conditions, which no one could have predicted." Cl. Tr. 34:2-5. Primary among these "other conditions" were the summer droughts in 1999 and 2000, which the government claims represent a "naturally occurring intervening event that breaks the causal chain between the Corps' actions and the timber mortality." Def.'s Post-Trial Br. at 9.

The government bases much of its rebuttal argument on the tree-core analyses performed by Dr. Grissino-Mayer and Mr. Williams. The government suggests that the tree-core data demonstrates "that the deviations did not correspond to decreased growth rates in these trees," which in turn shows that "there is no evidence of unusual flooding during the deviated years." Cl. Tr. 71:11-19. The government concludes that these analyses "support the conclusion that the

most likely explanation for the elevated tree mortality was not unusual flooding, but summer drought in 1999-2000, which may have quickly damaged trees in certain areas." Def.'s Post-Trial Br. at 58.

However, these various alternative causes suggested by the government do not withstand scrutiny. The tree cores were taken from stands of trees that were living in the summer of 2007, *see* DX 209 at 6 (Grissino-Mayer Report), not those that had died in and around 2000. As established above, the chain of foreseeable results set into motion by the Corps of Engineers' deviations from the authorized water control plan was not broken by any intervening event such as the drought in 1999 and 2000, even if such an event may have "tilted the scale" into excessive mortality. *See supra*, at 17-19, 32; Tr. 2437:22-23 (Baker). Nor was the chain of causation broken by any of these proffered alternative causes, because neither the drought nor the construction of beaver dams, considered either together or apart, can be said to have been the independent cause of the dramatically elevated timber mortality. Tr. 2443:23 to 2444:14 (Baker). The government represents that "[t]he critical difference between the pre-1993 and post-1999 conditions was not unusually high Black River flows or flooding events on the [Management Area] – it was the naturally-occurring summer drought in 1999 and 2000." Def.'s Post-Trial Br. at 34. But at many times prior to 1999, the Management Area had withstood multi-year droughts. In addition, the government avers "that the tree cores were collected from the exact same 6,990 acres that [p]laintiff contends were the most heavily impacted by the flooding," Cl. Tr. 72:6-9, but the Commission identified various problems with the government's sampling

methodology that render the government's tree-core study unfit to rebut plaintiff's causation argument. *See, e.g.*, Tr. 2445:3 to 2447:4 (Baker) (identifying problems regarding location of sample collection of data from outside plot boundaries where no living trees were present within plots, and use of data from intermediate and suppressed trees). Consequently, it is evident that the distinguishing factor producing the excessive mortality in 1999 and 2000 was the trees' roots' inability to withstand the moderate drought in those years after the extensive damage they suffered during the floods from 1993 to 1999.[23]

III. Damages Measured by Timber Loss

The just compensation requirement of the Fifth Amendment requires that an aggrieved property owner "be put in as good a position pecuniarily as if his property had not been taken." *Olson v. United States*, 292 U.S. 246, 255 (1934). Typically, courts measure just compensation by reference to the fair market value of the property taken. *See, e.g.*, *United States v. Fifty Acres of Land*, 469 U.S. 24, 30 (1984); *United States v. Chandler-Dunbar Water Power Co.*, 229 U.S.

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[23] Beavers did not have a significant impact on timber mortality or decline in the Management Area. Despite the theory advanced in Dr. Nutter's report that drainage problems caused by beaver dams "extended the period of standing water in the GTRs and the flood plain sites where beaver were know[n] to have occurred," DX 310 at 23 (Nutter Report), there was little evidence advanced at trial of an increased beaver population or an increase in beaver levees in the Management Area during the period of the deviations. In addition, as Dr. Heitmeyer pointed out, the presence of high water in the Management Area would have rendered negligible the effect of any beaver dams during the period of the Corps' deviations. Tr. 2833:5-10 (Heitmeyer).

53, 81 (1913). "Under [the fair-market-value] standard, the owner is entitled to receive 'what a willing buyer would pay in cash to a willing seller' at the time of the taking." *United States v. 564.54 Acres of Land*, 441 U.S. 506, 511 (1979) (quoting *United States v. Miller*, 317 U.S. 369, 374 (1943)). And, "since a transfer brought about by eminent domain is not a voluntary exchange, this amount can be determined only by a guess, as well informed as possible, as to what the equivalent would probably have been had a voluntary exchange taken place." *Kimball Laundry*, 338 U.S. at 6. Here, the government's temporary taking of a flowage easement over the Management Area resulted in a permanent taking of timber from that property, and the value of the timber thus serves as the basic measure of monetary relief to which the Commission is entitled.

In assessing fair compensation for the value of the timber taken by the government, the parties offer vastly different analyses of the effects of the Corps' deviations on the amount of timber lost by the Commission. The government and the Commission come to different conclusions regarding both what a normal background mortality rate would be and what the post-deviation mortality rate actually was in the Management Area.

A. Methodology

In addressing value, the Commission's experts started with the amount of timber that had died and subtracted the amount of timber that would have been expected to die using background mortality rates. *See* PX 79 at 9 (Kingwood Report II); PX 505 at 3 (Supplement to Kingwood Report I). The

Commission's experts also sought to identify the amount of timber that had entered a high-risk or declining state as a result of the Corps' deviations. PX 80 at 14 (Kingwood Report I). Then, by multiplying the volume loss of dead and potentially dying timber by the per-unit value of various timber species, the Commission's experts developed an appraisal of "[t]he loss in market value of merchantable timber and of potentially merchantable timber." PX 80 at 12 (Kingwood Report I); *see* PX 79 at 7 (Kingwood Report II).

Dr. Baker, Mr. Foster, and Mr. Livingston, working for Kingwood, performed two surveys and timber inventories on the Management Area. PX 79 at 1 (Kingwood Report II). The first of these surveys assessed Little River GTR, Reyno GTR, Winchester GTR, Gar Slough, and Schaeffer's Eddy, which have a combined area of 6,990 acres. PX 80 at 15 (Kingwood Report I). The second Kingwood survey assessed nine additional units in the Management Area, with a combined area of approximately 5,776 acres. PX 79 at 4 (Kingwood Report II). Because these nine additional units "were judged to be representative of the [entire] 11,633[-acre] secondary damage area" surveyed in the second study, the data from these nine cruised units was "extended to [an] additional 5,857 acres on an average per acre basis for damage appraisal purposes." *Id.*; *see* Tr. 2053:4-7 (Livingston) (remarking that Kingwood "cruised 5,700 acres because we felt like the 5,[7]00 was representative of the whole 11,000").

Within the five compartments on the first study area and the nine compartments on the second study area, Kingwood systematically distributed a series of circular plots, each measuring one-fifth of an acre. PX

80 at 13 (Kingwood Report I); PX 79 at 4 (Kingwood Report II). These plots were distributed so as to constitute a five percent sample of the entire survey area. PX 79 at 4 (Kingwood Report II). Then, in performing surveys on these plots, employees of Kingwood recorded their determinations regarding the species, size, and condition of all merchantable trees within each plot. PX 80 at 14 (Kingwood Report I); PX 79 at 4 (Kingwood Report II). The sawtimber species groups identified by Kingwood included red oak timber, white oak timber, and miscellaneous timber. PX 80 at 14 (Kingwood Report I); PX 79 at 5 (Kingwood Report II). Kingwood identified the height and diameter of the trees, and then calculated the volume of the trees using the Mesavage Girard Form Class Volume Tables, Doyle Rule. *Id.*; *see* PX 80 at App. B (listing estimated tree count and volume in compartments of first study area); PX 79 at App. A (listing estimated tree count and volume in compartments of second study area). Finally, Kingwood divided the trees into three different condition classes: dead, declining, and healthy. PX 80 at 14 (Kingwood Report I); PX 79 at 5 (Kingwood Report II). A tree was classified as dead if it had died within the past three years. Tr. 2075:17-23 (Foster). A tree was deemed to be declining if it was exhibiting "signs of loss of health and vigor" such as "'die back' in tree tops, necrotic lesions in the main stem or branches, and epicormic branching" that were sufficient to place the tree in "high risk status." PX 80 at 14 (Kingwood Report I); PX 79 at 5 (Kingwood Report II).

Kingwood appraised the per-unit value of dead timber by referring to "actual timber sale transactions involving timber of a similar character with

adjustments to account for differences." PX 80 at 16 (Kingwood Report I). This was in keeping with the Supreme Court's instruction that where "exchanges of similar property have been frequent," as is the case here, just compensation is based upon the typical prices for the property "arrived at by the haggling of the market." *Kimball Laundry*, 338 U.S. at 6. Kingwood evaluated four timber-sale transaction records from the Management Area from 1998 to 2000, and one timber-sale record from the Shirey Bay Wildlife Management Area in 1999. PX 80 at 16 (Kingwood Report I). The four sales in the Management Area registered an overall unit value average of $372.33 per thousand board feet ("MBF") based on an overall sale volume of 3,708.3 MBF, while the Shirey Bay sale registered a unit value average of $524.15 per MBF based on a sale volume of 1,175.3 MBF. *Id.* at 16. Factoring in the consensus of buyers and appraisers that timber from the Management Area was valued at seventy percent of the value of Shirey Bay timber, Kingwood concluded that the average value for timber in the Management Area would be $370 per MBF. *Id.* at 17. Kingwood further refined this analysis to account for the different unit values of different species, and concluded based on intuition and "oral interviews with buyers and p[ro]spective buyers of the subject timber" that red oak timber would be worth $464.38 per MBF, white oak timber would be worth $266 per MBF, and other miscellaneous timber would be worth $140 per MBF. *Id.* at 17.[24] In addition, Kingwood calculated damage

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[24] In its second report, Kingwood adjusted the price of red oak timber to $462.13 per MBF, based upon an additional timber sale

to pulpwood based on what it characterized as the "reasonable value" of $9 per cord. *Id.* at 17, 23. The government raised no significant objections to this method of per-unit valuation in its briefs or at trial,[25] and the court accordingly accepts plaintiff's valuations.

Once Kingwood had calculated the per-unit value of the timber it appraised, it multiplied this value by total volume lost to determine the total loss in merchantable value of trees, and applied various algorithms to account for whether a tree was classified as dead or declining. In assessing the value of dead trees, Kingwood based its per-unit valuation on "the total tree merchantable value as it existed prior to the death of the tree." PX 80 at 18 (Kingwood Report I). In ascertaining the value of declining trees, Kingwood based its valuation on its estimate that half of the declining trees would be dead within five years, and half would "recover and live a normal life span in a degraded condition." *Id.* Accordingly, Kingwood assessed a full-value loss for the half of the trees identified as declining, and assessed a fifty percent value loss for the other half of the trees identified as declining that would recover to a degraded condition. *Id.*

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in the Management Area that was factored into its appraisal methods. *See* PX 79 at 8 (Kingwood Report II).

[25] Dr. Steven Burak, who testified as an expert on behalf of the government, indicated in his report that an average of $380 per MBF would be appropriate, based on "adjustments for market conditions or changes in price levels between the date of sale and date of appraisal." DX 308 at 54 (A Retrospective Appraisal of Before and After Values of Timber in the Management Agrea (Apr. 11, 2008)) ("Burak Retrospective").

In addition, Kingwood imputed a background mortality rate of 0.5 or 0.75% to the areas it surveyed, which it attributed to "normal occurrences such as windthrow, light[]ning strikes, and etc." PX 79 at 4 (Kingwood Report II); *see* PX 505 at 2 (Supplement to Kingwood Report I). Kingwood subtracted this rate of background mortality from the rate of mortality it observed in the Management Area to derive the volume of trees lost as a result of the Corps' deviations. *See* PX 505 at 2 (Supplement to Kingwood Report I). Finally, Kingwood added the merchantable value of this volume of dead trees (as the value existed prior to the trees' death) to the pre-decline value of the volume of dying or degraded trees, and reached a total summary of the appraised value of losses in merchantable timber as a result of the Corps' deviations. PX 80 at 19 (Kingwood Report I); PX 505 at 3 (Supplement to Kingwood Report I); PX 79 at 10 (Kingwood Report II).

Based upon the two cruises and its appraisals of the per-unit value of timber in the Management Area, Kingwood concluded that the value lost for dead and declining timber in the first study area would be $4,516,000, PX 505 at 3 (Supplement to Kingwood Report I); Tr. 2244:11-13 (Foster), and that the value lost for dead and declining timber in the second area would be $1,961,000. PX 79 at 13 (Kingwood Report II); Tr. 2245:19-21 (Foster).

The government contends that Mr. Foster, on behalf of Kingwood, "ignored the extraordinarily high C[onfidence] I[nterval]s in the Kingwood data, did not consider the volume of timber that would have died even if the Corps had not deviated, utilized an unsupportable background mortality rate that is

irrelevant to the pre-1993 mortality rate on the [Management Area], and relied upon an erroneous theory of liability." Def.'s Post-Trial Br. at 60. The government additionally avers that "the Kingwood data showed there was no additional mortality resulting from the deviations." *Id.*

Most of these contentions have already been addressed. The high confidence intervals in the Kingwood data were an artifact of the small sample sizes of Kingwood's plots; once these samples were aggregated, the confidence interval substantially decreased. *See supra*, at 39-40. The Commission's experts used background mortality rates to consider the volume of timber that would have died in the absence of the Corps' deviations. *See supra*, at 38-39. Additionally, proofs at trial amply demonstrated that there was significant timber mortality resulting from the Corps' deviations. *See supra*, at 38-42.

More specifically, respecting damages, however, the government argues that the Commission's experts "presented no evidence to support th[e] highly unusual assumption" that the second Kingwood cruise of 5,700 acres would be representative of 11,000 acres. Def.'s Post-Trial Br. at 62. The government claims that "Mr. Livingston's guess that the 5,700 acres actually cruised was somehow 'representative' of the entire 11,633 acres is plainly wrong," given the diversity of trees in the Management Area and the range of three-year mortality, from 0.67% to 3.33%, found by Mr. Livingston during the second Kingwood cruise. *Id.* (citing DX 308 at 34 (Burak Retrospective) (listing mortality findings from second Kingwood cruise)). However, as established above, the Kingwood study followed generally accepted industry standards, and

the government did not successfully substantiate its allegations that the study was based on unrepresentative samples. *See supra*, at 15-16, 40; *see also* Tr. 1982:19 to 1983:9, 1984:9 to 1986:4 (Livingston) (establishing use of aerial photography and ground truthing to establish representative cruise areas); PX 53A, B, G, H, K, L, and M (aerial photographs taken in April 2000 showing dead trees throughout substantial portions of the Management Area). Accordingly, the court accepts the estimates of volume of dead and declining timber offered by Kingwood in its two studies.

B. Mortality Rate

As to the government's objection to the background mortality rate invoked by the Commission, the rates established by the Commission's experts are certainly not irrelevant to the pre-1993 mortality rate in the Management Area. *See supra*, at 40-41 (discussing the substance and context behind Dr. Baker's and Mr. Foster's analysis of mortality, and rejecting the government's argument that Commission experts were merely "speculat[ing] about a mortality rate one might expect on some imaginary [Management Area]" (quoting Def.'s Post-Trial Br. at 36)). However, the background rate used by Kingwood to measure valuation of timber losses may be slightly deflated from the actual background rate in the Management Area, given that these experts' estimates are at the lower end of the range of possible background mortality rates acknowledged by the Commission.

The Commission's experts, Dr. Baker and Mr. Foster, cite an average annual background mortality rate in the GTRs of 0.75% and 0.75 to 1%, respectively,

and an average annual background mortality rate in non-GTRs areas of 0.5% and less than 1%, respectively. *See* Tr. 2099:21 to 2100:9 (Foster); Tr. 2430:1-21 (Baker). The Commission acknowledges that based on all expert analysis, the average annual mortality rate might be "0.5% or 2% or somewhere in-between," but that in any case, "the mortality reported by [Kingwood] is greatly in excess of these values." Pl.'s Reply at 27.

However, although this estimated level of annual background mortality reflected the mortality rate of 0.5% in the control stands surveyed by Kingwood, *see* Tr. 3528:6-9 (Burak), it is evident that a mortality rate of 0.5% is not sufficient to account for the inherent variability in mortality rates on a heterogeneous forest. Nonetheless, the normal mortality rate in the Management Area is not as high as the government avers; the 2 to 6% mortality rate cited by Dr. Burak, Tr. 3529:13-16 (Burak), is far out of proportion to the mortality rates cited by other experts in this case, including Dr. King, another expert called by the government. *See* Tr. 3373:24 to 3374:5 (King) (averring that a 2 to 6% background mortality rate would be inappropriate, and agreeing with Dr. Baker's characterization of background mortality). The court finds that a background mortality rate of 1.25% for non-GTR units and 1.75% for GTRs units is a fair estimate, based upon the evidence presented at trial, the higher acknowledged background rate of mortality in GTR, and the Commission's acknowledgment of a potential range of background mortality from 0.5% to 2% percent.

C. Dead and Impaired Trees

The government raises two sets of objections to the Commission's estimates regarding declining timber. First, the government argues that Mr. Foster wrongly assumed that the deviations were the sole cause of the decline in timber, and consequently "ignored the[] pre-existing conditions and overstated any damage arising from the deviations." Def.'s Post-Trial Br. at 60. On this point, it has already been established that the pre-existing conditions in the Management Area played little role in causing the increases in timber mortality compared to the Corps' deviations, *see supra*, at 19-20, and the same can be said of their role in causing increases in timber decline.

Relatedly, the government argues that Mr. Foster "based his estimated value of 'Declining Timber' on the unsupported assumption" that half of the declining trees would be dead within five years, and the other half would live a normal life span in a degraded condition. Def.'s Post-Trial Br. at 60-61 (citing PX 80 at 18 (Kingwood Report I)). The government further contests Mr. Foster's assumption that this latter half of the declining trees, the group that would eventually recover into a degraded condition, should be valued at one-half the value of the healthy timber. *Id.* at 61. However, the court finds that Mr. Foster was warranted in making his assumptions regarding the impaired value of declining trees, based on observed qualitative losses to the trees, irregular distribution of declining timber, and other constraints that stand in the way of efficient salvage of a forest with declining timber. *See* PX 80 at 18 (Kingwood Report I); Tr. 2287:9 to 2290:10 (Foster).

Kingwood's appraisal of the value lost must be ljusted for a higher background mortality rate of 25% for non-GTRs units and 1.75% for GTR units. ıe three units in GTRs were Little River, Reyno, and inchester. In inventorying the first study area, ingwood found a total of 14,355.1 MBF of red oak nber, 5,562.2 MBF of white oak timber, and 5,025.8 BF of miscellaneous timber in these green tree units. X 505 at 5 (Supplement to Kingwood Report I). ıased on its analysis of the previous three-year period, ingwood found that within these three units, 3,322.2 BF of red oak timber had died, 474.3 MBF of white ık timber had died, and 576.6 MBF of miscellaneous nber had died. PX 80 at 15 (Kingwood Report I). ɔplying a three-year background mortality rate of 25%, the following volumes of timber would have ed under normal conditions: 753.6 MBF of red oak nber, 292.0 MBF of white oak timber, and 263.9 BF of miscellaneous timber. Accordingly, the nount of timber lost as a result of the Corps' ɛviations in GTRs units in the first study area is as llows: 2568.6 MBF of red oak timber, 182.3 MBF of hite oak timber, and 312.7 MBF of miscellaneous nber.

The two units not in GTRs were Gar Slough and ɛhaeffer's Eddy. In inventorying these two areas, ingwood found a total of 3,528.5 MBF of red oak nber, 2,749.6 MBF of white oak timber, and 1,690.6 BF of miscellaneous timber. PX 505 at 5 upplement to Kingwood Report I). Based on its ıalysis of the previous three-year period, Kingwood und that within these two units, 872.9 MBF of red ık timber had died, 380.7 MBF of white oak timber ıd died, and 206.9 MBF of miscellaneous timber had ed. PX 80 at 15 (Kingwood Report I). Applying a

three-year background mortality rate of 3.75%, the following volumes of timber would have died under normal conditions: 132.3 MBF of red oak timber, 103.1 MBF of white oak timber, and 63.4 MBF of miscellaneous timber. Accordingly, the amount of timber that died as a result of the Corps' deviations in GTRs in the first study area is as follows: 740.6 MBF of red oak timber, 277.6 MBF of white oak timber, and 143.5 MBF of miscellaneous timber.

In summary, based on the first Kingwood study, a total of 3309.2 MBF of red oak timber, 459.9 MBF of white oak timber, and 456.2 MBF of miscellaneous timber died as a result of the Corps' deviations. Based on valuations of $464.38 per MBF for red oak timber (for a total lost of $1,536,726.30), $266 per MBF for white oak timber (total of $122,333.40), and $140 per MBF for miscellaneous timber (total of $63,868.00), the total value of dead timber lost based on this first study is $1,722,927.70.

As to the value of declining timber identified in the first study, based on the same valuations, 5,730.5 MBF of declining red oak (total of $2,661,129.59), 1,348.3 MBF of declining white oak (total of $358,647.80), and 1,606.4 MBF of declining miscellaneous timber ($224,896.00) yields a total of $3,244,673.39. With Mr. Foster's estimate of the value of declining timber, which assumes a full value loss for half of declining trees and a 50% value loss for the other half of declining trees, adding one-half plus one-fourth, 50% of one-half, of each of these totals yields $2,433,505.04. Thus the total value of dead plus declining timber on the first study area is $4,156,432.74.

Turning to the second study area, Kingwood found a total of 20,031.9 MBF of red oak timber, 9,442.2 MBF of white oak timber, and 8,281.9 MBF of miscellaneous timber in the nine units it surveyed. PX 79 at 6 (Kingwood Report II).[26] Based on its analysis of the previous three-year period, Kingwood found that within these three units, 1,104.3 MBF of this red oak timber had died, 182.2 MBF of white oak timber had died, and 436.7 MBF of miscellaneous timber had died. *Id.* Applying a three-year background mortality rate of 3.75%, the following volumes of timber would have died under normal conditions: 751.2 MBF of red oak timber, 354.1 MBF of white oak timber, and 310.6 MBF of miscellaneous timber. Accordingly, the amount of timber that died as a result of the Corps' deviations in the second study area is as follows: 353.1 MBF of red oak timber, and 126.1 MBF of miscellaneous timber.[27] Extrapolating directly from the 5,776 acres surveyed in the second study to the 11,633 acres for which the surveyed area was deemed to be representative, approximately 711.2 MBF of red oak timber and 254.0 MBF of miscellaneous timber died as a result of the Corps' deviations in the

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[26] The second area surveyed by Kingwood appeared to include few if any plots that were contained within a GTR, *see* PX 79 (Kingwood Report II) (map of areas surveyed during second Kingwood study), and Mr. Foster's application of a lower background mortality rate to this entire study area reflects the circumstance that this survey was composed principally if not entirely of non-GTR units. *See id.* at 9.

[27] In this situation, 171.9 *fewer* MBF of white oak timber died than would have been expected under the three-year background mortality rate of 3.75 percent. This circumstance suggests that the court's use of a 1.25% mortality rate might be too high, at least for white oak.

complete second study area. Based on valuations of $462.13 per MBF for red oak timber (or a total of $328,666.86) and $140 per MBF for miscellaneous timber (total of $35,560), the total value of dead timber based on the second study is $364,226.86.

As to the value of declining timber identified in the second study, 1,239.8 MBF of red oak, 183.7 MBF of white oak, and 673.4 MBF of miscellaneous timber were identified as declining. PX 79 at 6 (Kingwood Report II). Again, extrapolating from the acres actually surveyed in the second study to the 11,633 acres for which the surveyed area was deemed to be representative, approximately 2,497.0 MBF of red oak (total of $1,153,938.61), 370.0 MBF of white oak ($98,420.00), and 1356.2 MBF of miscellaneous timber (total of $189,868.00) were declining as a result of the Corps' deviations. *See id.* at 6. With Mr. Foster's estimate of the value of declining timber, which assumes a full value loss for half of declining trees and a 50% value loss for the other half of declining trees, adding one-half plus one-fourth, 50% of one-half, of each of these totals yields $1,081,669.96. Thus the total value of dead plus declining timber in the second study area is $1,445,896.82.

Accordingly, the fair market value of damages to timber in the Management Area caused by the Corps of Engineers amounts to a total of $5,602,329.56. The Commission is entitled to this amount as just compensation for the taking of its property interest in timber.

IV. Additional Damages

The Commission seeks additional damages for the expenses that it would incur in "removing extensive, invasive wetlands vegetation, [and] . . . remediating the soil and habitat, so that the same type of bottomland timber that was taken by [the] Corps can be restored." Pl.'s Post-Trial Br. at 8. Although the parties have generally referred to this aspect of the Commission's claim as one for "restoration" costs, that term is inaccurate in this context because the costs are not intended as a means of restoring contemporaneously the forest that was destroyed. Rather, the costs would be incurred to enable the forest to regenerate itself over a considerable period of time. Hence, the claimed costs will be termed "regeneration" costs or damages.

In support of its claim for regenerative damages, the Commission relies on the Supreme Court's decision in *Dickinson*, 331 U.S. 745, and the Federal Circuit's decision in *Cooper*, 827 F.2d 762. The Commission asserts that these precedents support its claim for regenerative damages because the government's taking "left the . . . [property] devalued, . . ., in the sense that there is groundcover that did not exist, and the forest is unable to regenerate the species of hardwoods naturally that had been present." Cl. Tr. 20:19-23. The Commission seeks approximately $5,000,000 in these costs, comprised of expenses to remove wetland species and of plantings to regenerate a forest cover. Pl.'s Post-Trial Br. at 32. The Commission seeks to recover $2,158,585 for treatment to "control the [growth of] undesirable species and allow regeneration of the desired species." *Id.*; *see* Tr. 1630:11 (Test. of Rick Watts, Territory Manager for

UAP Distribution, Inc. ("UAP")). Additionally, the Commission claims that "[a]rtificial restoration is necessary because with the vegetation taking over the forest floor in most areas and the additional release of shade tolerant species," the natural regeneration of oak trees is not feasible. Pl.'s Post-Trial Br. at 30. The Commission presented an estimate for projected plantings costing between $2,813,475 and $3,564,900. PX 501 at 3 (Recommendations and Cost Estimates to Reestablish Oak-Dominated Forests on Damaged Areas on the Dave Donaldson/Black River WMA prepared by Martin Blaney, Habitat Coordinator (Nov. 20, 2007)).

The government resists this claim on three distinct grounds. First, the government argues that the Commission is unable "to show that the restoration costs directly resulted from the taking of [the] timber." Cl. Tr. 76:7-9. Secondly, the government asserts that the Commission failed to establish that the government's actions resulted in the devaluation of the affected areas of plaintiff's property by invasive growth. Cl. Tr. 76:20-25. Lastly, the government claims that the regenerative damages the Commission seeks to recover are, at best, consequential damages and thus cannot be recovered in this inverse condemnation proceeding. Def.'s Post-Trial Br. at 12.

A. Regeneration Damages

The Fifth Amendment requires the United States to pay "just compensation" whenever it takes private property for public use. U.S. Const. amend. V. The Supreme Court has explained that the Fifth Amendment's just compensation requirement dictates that "[t]he owner is to be put in as good [a] position

ecuniarily as he would have occupied if his property ıd not been taken." *Miller*, 317 U.S. at 373. In most ses, just compensation is measured by reference to e fair market value of the property taken. *See, e.g.*, *fty Acres of Land*, 469 U.S. at 30; *Chandler-Dunbar ater Power Co.*, 229 U.S. at 81. Thus, in many kings cases, the fair-market-value standard does not quire the government to compensate certain losses at the property owner may experience. *See, e.g.*, *mball Laundry*, 338 U.S. at 5 (stating that the "loss the owner of nontransferable values deriving from s unique need for property or idiosyncratic tachment to it, like loss due to an exercise of the lice power, is properly treated as part of the burden common citizenship").

The Commission relies on the Supreme Court's cision in *Dickinson* to support its claim for generation damages. In *Dickinson*, the government ught "to improve the navigability of the Kanawha ver" by constructing a dam. 331 U.S. at 746. By ising the water level, the dam caused the rrounding land to be permanently flooded. *Id.* at 6-47. The district court awarded damages for the wage easement taken by the United States and for e erosion caused by the flooding, and the Court of peals for the Fourth Circuit affirmed the district urt's decision. *Id.* at 747. The Supreme Court firmed the award of damages for erosion, ruling gainst the government's contention that such mages were consequential, citing the principle that w]hen the part not taken is left in such shape or ndition as to be in itself of less value than before, the vner is entitled to additional damages on that count.'" *Id.* at 750 (quoting *Bauman v. Ross*, 167 .S. 548, 574 (1897)). In the instant matter, the

Commission seeks to draw "an analogy between the erosion in *Dickinson* and the adjunct of invasive species that are extraordinarily difficult to remove." Cl. Tr. 24:14-16. Thus, the Commission is claiming "additional damages" under the regeneration rubric and is not putting forth an alternative means of measuring damages in the place and stead of the timber measure previously addressed.[28]

Besides *Dickinson*, the most relevant precedents regarding the Commission's claim for additional regeneration costs are the Supreme Court's temporary takings cases decided during and after World War II: *Kimball Laundry*, 338 U.S. at 3; *Petty Motor*, 327 U.S. at 374; and *General Motors*, 323 U.S. at 379-84. In

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[28] For these reasons, the "cost of cure" cases are not pertinent because that mode of recovery has been viewed as an alternative to a fair-market-value basis for determining just compensation. *See, e.g., Vaizburd v. United States*, 384 F.3d 1278, 1286 (Fed. Cir. 2004). There, the court of appeals observed that "[c]ost of cure is not a separate claim but merely a separate theory for computing the amount of takings liability." *Id.* at 1285 n.8 (citing *Ridge Line*, 346 F.3d at 1358-59); *see also* 4A *Nichols on Eminent Domain* § 14A.04[2][a] (stating "that the cost to cure, while admissible for the purpose of establishing just compensation, does not create individual rights to damages"). In *Vaizburd*, the costs at issue were the expenses of removing sand that was accreting annually on portions of plaintiffs' property. *See* 384 F.3d at 1285. Correlatively, the cost at issue in *Ridge Line* was "Ridge Line's cost in constructing prudent flood control measures," which might serve as an alternative to "the price the government has paid for flowage easements in comparable situations." 346 F.3d at 1359. Here, the Commission is not seeking to recover such costs, *e.g.*, for levees to prevent future flooding during growing seasons, which would not be needed because the Corps has ceased its deviations. Moreover, costs actually to restore dead and damaged mature oaks on a contemporaneous basis would be wholly impracticable.

both *Kimball Laundry* and *Petty Motor*, the Supreme Court was concerned with determining the proper measure of monetary relief that the property owners were entitled to receive due to the government's temporary taking. *Kimball Laundry*, 338 U.S. at 4-21; *Petty Motor*, 327 U.S. at 377-81; *see also General Motors*, 323 U.S. at 380-81 (setting forth factors that could be utilized to determine the value of the property taken when the government only temporarily takes the property). In *Petty Motor*, the Supreme Court explained that "[t]here is a fundamental difference between the taking of a part of a lease and the taking of the whole lease. That difference is that the lessee must return to the leasehold at the end of the [g]overnment's use." 327 U.S. at 379.

In both *Kimball Laundry* and *Petty Motor*, the Supreme Court ruled that when the government's actions constitute a temporary taking, the plaintiff's measure of recovery was not limited to the fair market value of property established in an arms-length transaction. *Kimball Laundry*, 338 U.S. at 15; *Petty Motor*, 327 U.S. at 379-80. In *Kimball Laundry*, the Supreme Court was confronted with the temporary taking of a laundry business that prevented it from operating during that period. 338 U.S. at 3. In this context, the Supreme Court found that the owners of the business were subject to a temporary taking and were entitled to receive compensation for rental value, damage to plant and equipment beyond ordinary wear and tear, and the going-concern value and goodwill which were rendered useless during the duration of the taking. 338 U.S. at 10-11, 14. In *Petty Motor*, the Supreme Court found that the cost of temporary removal could factor into determining the value of a tenant's leasehold interest in a property because of the

lessee's "continuing obligation" towards the premises. *Petty Motor*, 327 U.S. at 379-80.

These temporary takings cases from World War II provide support for the Commission's claim for regeneration damages. In the context of a permanent taking, such costs are not normally appropriate because the owner or occupant of the property will not have the ability to use or occupy the property in the future. Here, the government's actions resulted both in the destruction of timber and in the substantial alteration of the condition of some of the property from its original state. The flooding caused by the government's deviations from the operating plan for the Clearwater Dam and the vanishing overstory due to the high mortality rate of the trees in the affected areas have combined to created an environment that was hospitable for the development of invasive species, like buttonbush and smartweed, that inhibit or prevent the natural regeneration of oak trees. *See* Tr. 2401:22 to 2402:18 (Baker); *see also* Tr. 620:21-23 (Blaney); Tr. 1192:16-20, 1238:12-13 (Hausman); Tr. 1592:12-14 (Watts) (stating that natural regeneration of nuttall and overcup oaks would not be possible at the present time because sprouting acorns would have to compete for sunlight with the invasive species). Dr. Baker explained that in his opinion buttonbush presented more difficult problems for forest regeneration than the typical "understory vegetation" that is present in bottom-land hardwood stands. Tr. 2402:15-18 (Baker).[29] Furthermore, Dr. Baker

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[29] Buttonbush is a large shrub that has dense foliage, which creates "a lot of shade on the ground." Tr. 2402:10-12 (Baker). According to his observations, Dr. Baker believed that the

explained that "[s]martweed makes a mat" that would prevent "an oak seedling . . . [from] grow[ing] through it." Tr. 2402:6-9 (Baker).

Because of the presence of invasive species, especially bottonbush and smartweed, an award of regeneration costs would not constitute an impermissible double recovery. If the Commission had merely engaged in clear cutting, the invasive species would not have been able to establish such a foothold because saturated soil conditions necessary for their growth would not have been present. *See, e.g.*, Tr. 1192:4-8 (Hausman); 2401:22 to 2402:18 (Baker); *see also* Tr. 1667:11-22 (Watts) (explaining that clear cutting will "promote some of the less[] desirable[]" species but the quantity of invasive wetland species in the affected portion of the Management Area greatly exceeds that which would result from controlled harvesting of timber). Dr. Baker explained that he had never seen such an expansive amount of wetland species "in [a] bottom-land hardwood stand." Tr. 2397:22 to 2398:9 (Baker). The presence of these wetland species has resulted in competition in the understory between them and bottomland hardwood trees, such "that [the Commission has] to control [the wetland species] in order to promote the growth and development of oak regeneration." Tr. 2401:22 to 2402:5 (Baker). In operating the Management Area, the Commission seeks to promote sustainability. To achieve that goal, the Commission periodically harvests selected mature trees by a process of thinning that allows for the natural regeneration of the trees to

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majority of the buttonbush trees began to take hold in the mid-1990s. Tr. 2398:16-20 (Baker).

occur. *See* Tr. 130:5-8, 14-25 (Zachary). However, the presence of invasive species has prevented the natural regeneration of timber from occurring. Tr. 620:21 to 621:4 (Blaney); 2397:22 to 2398:9 (Baker).

Given the pervasive nature of the unwanted wetland vegetation in portions of the affected area, and the concomitant need to eradicate and remove those unwanted species and employ planting of seedlings to regenerate the forest, the Commission has sustained its burden of proving that it suffered additional damages beyond the destruction of trees as a result of the government's deviations from the operating plan for the Clearwater Dam. *See Fifth Third Bank v. United States*, 518 F.3d 1368, 1379 (Fed. Cir. 2008) (stating that the Federal Circuit has "interpreted the 'reasonable certainty' standard to apply only to the fact of damages, after which the court "may make a fair and reasonable approximation of the damages'" (citing *Bluebonnet Sav. Bank, F.S.B. v. United States*, 266 F.3d 1348, 1356-57 (Fed. Cir. 2001))). Thus, the court will turn to determining the amount of restoration damages that the Commission is entitled to recover.

B. Measurement of Regeneration Damages

The Commission seeks to recover regeneration costs for approximately 6,990 acres located in the Management Area. *See* PX 476 at 1 (UAP's Evaluation of Vegetation Management Requirements for Control of Invasive Species); PX 501 at 1 (Recommendations and Cost Estimates). According to the estimates provided by Commission, as of 2007, $2,158,585 would be required to remove invasive wetland species. *See, e.g.*, PX 476 at 4 (UAP's Evaluation); Tr. 1630:11

(Watts).[30] The Commission also proffered evidence that planting of seedlings as of 2007 would have cost between $2,813,475 and $3,564,900. PX 501 at 3 (Recommendations and Cost Estimates).

The government claims that the court should ignore the estimates provided by the Commission for treatment and planting costs. Def.'s Post-Trial Br. at 64-68. Among other things, the government contends that the Commission's projections "includ[e] the cost to remove all invasive species – including those plants that were present . . . before 1993." *Id.* at 68. The government also objects to the sampling method used by Mr. Watts and the Commission to develop the proffered cost projections. *Id.* at 67. The government relies on the fact that Martin Blaney, the individual who prepared the cost estimate, lacked experience with reforestation efforts through underplanting, that the Commission had never previously utilized his method of underplanting, that his estimates did not account for natural regeneration, and that he failed to collect "any data to inform or support his opinion about the volume of seedlings needed." *Id.* at 64-65. The problems that the government has identified relate more to the weight the court will accord the estimates in determining the proper amount of regeneration damages than to the court's consideration of them *vel non*.

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[30] The evaluation by UAP stated that the treatment regiment would cost approximately $2,472,063.94. PX 476 at 4 (UAP's Evaluation). At trial, Mr. Watts of UAP stated that the cost of treatment program was $2,158,585 and that the estimate in PX 476 was incorrect due to clerical errors. Tr. 1630:11-20 (Watts).

The acreage for which the Commission seeks to recover restoration costs includes parts of five distinct parcels: the Little River Island GTR, the Reyno GTR, the Winchester GTR, Gar Slough, and Schaeffer's Eddy. *See, e.g.*, PX 476 at 2 (UAP's Evaluation); PX 80 at 5-7 (Kingwood Report I). The program outlined by the Commission envisions employing herbicides to control and eliminate invasive wetland species and then planting seedlings. PX 476 at 2-3 (UAP's Evaluation). The Commission supplied Mr. Watts with information regarding which areas of the Management Area had been impacted and the severity of damage those areas had sustained. Tr. 1585:13-16, 1603:10 to 1604:10 (Watts). Two potential methods were considered for determining the severity of the growth of invasive species. Tr. 1586:12 to 1587:9 (Watts). "[D]etailed plot data" could be generated, or a less rigorous visual examination could be used. Tr. 1586:12 to 1587:9 (Watts). In the instant case, Mr. Watts and the Commission relied on a visual evaluation. Tr. 1587:12-13 (Watts). Mr. Watts relied on the Commission's staff to take him to areas in each of the five tracts that were representative of the growth of invasive wetland species. Tr. 1596:16-19 (Watts).

In formulating his report, Mr. Watts classified the areas examined into three categories of damage. PX 476 at 2 (UAP's Evaluation). At the trial, Mr. Watts explained that areas were classified as severe if "nothing was there but buttonbush and . . . herbaceous material." Tr. 1596:25 to 1597:1 (Watts). Areas that had a substantial population of arborescent brushy material and undesirable trees were considered to have suffered heavy damage. Tr. 1597:3-6 (Watts). Areas that still had a rather significant population of

oak trees coexisting with the invasive wetland species were classified as having sustained moderate damage. Tr. 1597:6-9 (Watts). The Commission provided Mr. Watts with the number of acres that it believed should be included in each category. 1597:9-14 (Watts). Mr. Watts explained that the Commission informed him that five percent of the 6,990 acres should be classified as severe, thirty-five percent should be classified as heavy, and sixty percent should be classified as moderate. 1635:14-21, 1636:8-16 (Watts).

After completion of the treatment portion of the project to eliminate the wetland species, the Commission proposes to plant advanced nuttall and overcup oak seedlings. PX 501 at 1 (Recommendations and Cost Estimates). This planting regimen was developed after consultation with an outside expert. *See* Tr. 865:16-19 (Blaney); PX 501 at 2 (Recommendations and Cost Estimates). The Commission decided to plant "a mix ([o]vercup/[n]utall oaks) of 15-20 seedlings per acre (ave. 17.5) throughout the disturbed sites. The percentages by species will be 75% [n]uttall oak and 25% [o]vercup oak." PX 501 at 2 (Recommendations and Cost Estimates). The Commission estimated that it would cost between fifteen and twenty dollars to plant each seedling because each of the advanced seedlings would need a tree shelter and could only be planted by using "a tractor and auger." *Id.* The Commission estimated that it would need to plant approximately 122,325 seedlings at a cost of between $1,834,875 and $2,446,500. *Id.* at 3. A further phase of the Commission's program involves "[h]and planting miscellaneous tree species, indigenous to these damaged sites (persimmon, green ash, sugarberry, etc.) with bare-root stock seedlings on a grid of 12' [by]

12' or 302 seedlings per acre throughout the disturbed sites." *Id.* at 2. This phase of the reforestation plan would have an estimated cost between $140 and $160 per acre. *Id.* The Commission projects that the hand planting would have a total cost between $978,600 and $1,118,400. *Id.* at 3.

The Commission has not proved that it is entitled to recover all of its projected regeneration costs. The court's site visit to the Management Area confirmed that discrete portions of the Management Area require regenerative work due to the proliferation of invasive wetland species like buttonbush and the absence of any bottomland hardwood timber. However, the Commission has failed to submit adequate evidentiary materials regarding certain areas where it seeks to recover regeneration costs and the prevailing conditions in those places. The court accordingly must parse the Commission's claims to sift those areas as to which there is proof to a reasonable certainty and those areas as to which proof is inadequate.

The Commission has provided sufficient evidence to demonstrate that it is entitled to recover regeneration costs for the 349 acres that were classified as "severe." PX 476 at 2 (UAP's Evaluation). These 349 acres are effectively devoid of any oak trees and populated by invasive wetland species. *See, e.g.*, Tr. 1192:12-20 (Hausman); Tr. 2225:7-21 (Foster). Many of the witnesses at trial confirmed that "there was [an] unusual density and abundance of wetland vegetation that [they had] never seen growing in [a] bottom-land hardwood stand." Tr. 2397:22 to 2398:9 (Baker); *see* Tr. 1192:4-8 (Hausman); Tr. 1591:14-19 (Watts). Due to the site visit, the court was able to confirm the pervasiveness of invasive wetland species and the

scarcity of oak trees in portions of the Management Area.

However, the Commission has not established to a reasonable certainty the need for regeneration damages for the remaining 6,641 acres. Undoubtedly parts of that acreage contain clusters of invasive wetland species, some of which may be sizeable. Nonetheless, there is no basis in the record to differentiate the areas that would require regenerative work from others which retain some oak stands of significance and which may well regenerate themselves, albeit over the course of many years. Thus, the Commission can only recover regeneration costs for the 349 acres that were classified as severe by Mr. Watts and which the court in a reasonable way confirmed by the site visit.

It is well-established that property is to be valued on the date the taking occurred. *See, e.g., 564.54 Acres of Land*, 441 U.S. at 511-13. Here, the Commission's witnesses based their costs for treatment and planting on the state of the affected portions of the Management Area in 2007. *See, e.g.*, Tr. 1585:8-10 (Watts); Tr. 964:1-5 (Blaney). However, the Corps ceased deviating from the operating plan for the Clearwater Dam in 2001. PX 575 at US33 (Corps' News Release). Thus, the Commission's proposed reforestation and treatment costs are based upon the circumstances in the Management Area after the government had ceased causing a superinduced flow of water to flood the area.

The Supreme Court in *Dickinson* set forth the controlling principle that when a taking occurs through a continuous process the claim for

compensation does not arise "until the situation becomes stabilized." 331 U.S. at 749 (stating that "when the [g]overnment chooses not to condemn land but to bring about a taking by a continuing process of physical events, the owner is not required to resort either to piecemeal or to premature litigation to ascertain the just compensation for what is really 'taken'"). In *Cooper*, the Federal Circuit applied the principle articulated in *Dickinson* to determine when the government's taking of the timber occurred. *See* 827 F.2d at 764. The Federal Circuit explained that "the critical question is: when did the destruction of trees become sufficiently stabilized so that the owner could determine the amount of timber taken?" *Id.* In *Cooper*, the Federal Circuit stated that although trees began to die on the plaintiff's property in 1979, "the extent of the destruction was not ascertainable until 1984, when J.R. Cooper filed suit." *Id.*

Here, the first deviations from the Corps' management plan occurred in 1993 and inundation of portions of the Management Area ceased in 2000. Stip. ¶ 15. However, although the situation began to stabilize in 2000, insofar as invasive wetland species were concerned, the cessation of deviations did not complete that process. Areas where wetland vegetation had gained primacy continued to mature and close out natural regenerative growth on the part of the previously existing oak trees. Moreover, in 2000 and 2001, Kingwood Forestry Services conducted an extensive survey and timber inventory in numerous sections of the Management Area. *See supra*, at 14-16. These developments would have allowed the Commission to determine with sufficient precision the amount of timber that was taken due to the government's actions and the areas that were severely

affected by invasive wetland species. Thus, the appropriate year for determining the cost of the treatment programs for regeneration was 2001, not 2007.

The government asserts that the Commission's failure to present its estimates for regeneration costs based on the situation as it existed in 2000 or 2001 should prevent the Commission from recovering those costs. *See* Def.'s Post-Trial Br. at 62. The government's argument is misplaced. The Federal Circuit has explained that "[t]he ascertainment of damages is not an exact science, and where responsibility for damage is clear, it is not essential that the amount thereof be ascertainable with absolute exactness or mathematical precision." *Bluebonnet Sav. Bank*, 266 F.3d at 1355. It is apparent that the need and cost for treatment and reforestation would be different in 2001 and 2007, given the time value of money and resources. The Commission, however, was able to produce sufficient evidence such that the court is able to conclude that the condition of the 349 acres of property, for which the Commission can receive regeneration costs, was substantially stabilized in 2001. *See, e.g.*, Tr. 2345:4-24 (Baker). Given the similar conditions of the property in 2001 and 2007, the 2007 projections relied upon by the Commission do not have to be disregarded. However, the estimates provided by the Commission do need to be modified to reflect what it would have cost in 2001 to undertake the treatment and planting programs for the 349 acres.

In 2007, based on the estimates provided by the Commission, it would have cost approximately $206,555.65 to implement the regeneration program

for the 349 acres that were labeled as having severe damage. It would cost $66,083.15 to employ the Commission's treatment regime and $140,472.50 to implement its planting program. *See* PX 476 at 4 (UAP's Evaluation); PX 501 at 2 (Recommendations and Cost Estimates) (based on 17.5 seedlings per acre at $15 per seedling). Adjusting those numbers to reflect the passage of six years from the date of stabilization to when the Commission prepared its cost estimates, using the comparative purchasing power of the dollar in 2001 and 2007, is appropriate in the circumstances. With this adjustment, based on the Consumer Price Index, the Commission is entitled to recover $176,428.34, the equivalent in 2001 of $206,555.65 in regeneration costs measured at 2007.

V. Interest

"If the Government pays the owner before or at the time the property is taken, no interest is due on the award . . . [b]ut if disbursement of the award is delayed, the owner is entitled to interest thereon." *Kirby Forest Indus., Inc. v. United States*, 467 U.S. 1, 10 (1984) (internal citation omitted). Accordingly, if the government does not pay compensation at the time of the taking, the Takings Clause requires a payment of interest. *Seaboard Air Line Ry. v. United States*, 261 U.S. 299, 306 (1923); *see also Library of Cong. v. Shaw*, 478 U.S. 310, 317 n.5, (1986), *superseded on other grounds by statute*, Civil Rights Act of 1991, Pub. L. No. 102-166, 105 Stat. 1071. Because the government did not compensate the Commission at the time of the taking, the just compensation award due to the Commission should include interest on the present value of the damages it suffered from and after October 11, 2000, the end of the temporary taking of

timber, and from and after October 11, 2001, the end of the taking period for regeneration damages.[31]

In its complaint, the Commission sought an award of just compensation, *see* Compl. at 10, which would include interest, and the government answered the complaint with a general denial. *See* Answer at 7. However, neither party adduced evidence at trial related specifically to interest. The court accordingly is in a position where it is obliged under the teachings of *Kirby Forest Industries* and *Seaboard Air Line Railway* to incorporate interest in the award of just compensation, but it must do so on a barren record.

The determination of an appropriate interest rate is based on the so-called "prudent investor rule," which measures "how 'a reasonably prudent person' would have invested the funds to 'produce a reasonable return while maintaining safety of principal.'" *Tulare Lake Basin Water Storage Dist. v. United States*, 61 Fed. Cl. 624, 627 (2004) (quoting *United States v. 429.59 Acres of Land*, 612 F.2d 459, 464-65 (9th Cir. 1980)). In this instance, the ten-year Treasury STRIPS rate[32] will be applied for three key reasons: (1) Treasury STRIPS reflect minimal risk, (2) ten-year STRIPS roughly approximate the length of time from the end of the taking to the date of judgment, and (3)

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[31] The growing season for the Management Area extends from approximately April 4 to October 11. *See* PX 500 at 11 (Heitmeyer Report); Tr. 2672:17-25 (Overton).

[32] "STRIPS" is the acronym for "Separate Trading of Registered Interest and Principal of Securities." *See* U.S. Dep't of the Treasury, *Treasury Strips*, at http://www.treasurydirect.gov/instit/marketables/strips/strips.htm (last accessed June 30, 2009).

the court has a judicial policy favoring generally comparable interest rates for similarly situated plaintiffs. *See Georgia-Pacific Corp. v. United States*, 640 F.2d 328, 365-66 (Ct. Cl. 1980) (favoring uniform interest rates).[33]

For a taking that occurred a considerable time before judgment, as here where the taking took place between nine and sixteen years ago, the court would ordinarily consider application of compound interest. The Federal Circuit has said that in some cases compound interest may be necessary "'to accomplish complete justice'" under the Takings Clause. *Dynamics Corp. of Am. v. United States*, 766 F.2d 518, 520 (Fed. Cir. 1985) (quoting *Waite v. United States*, 282 U.S. 508, 509 (1931)). In this instance, however, there is no evidence that compounding is necessary to satisfy the mandate of the Takings Clause beyond that provided by the Treasury STRIPS themselves, for which interest accrues daily and is added every six months to the security's principal.

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[33] The court has considered the use of the interest rate specified in 40 U.S.C. § 3116 that applies to just compensation attendant to a declaration of taking. Under this statute, the rate applicable for a period of more than one year is specified as, for the first year, the "annual rate equal to the weekly average one-year constant maturity Treasury yield," and, for the next year and each subsequent year, at the one-year Treasury rate for "the calendar week preceding the beginning of each additional year." 40 U.S.C. § 3116(a). That rate, however, does not apply to inverse condemnation cases such as this one, and it is not structured to pertain to such a long period as that which will occur in this case between the date of taking and the entry of judgment. Accordingly, the court has looked to a Treasury rate that more closely approximates the delay evident here.

CONCLUSION

For the reasons stated, the court finds that the Commission has suffered a temporary taking for which just compensation is due. The court awards the Commission as of the end of the takings period, October 11, 2000 (the end of the growing season), $5,602,329.56, measured by timber lost and destroyed, and $176,428.34 in additional damages for a regeneration program to address areas severely affected by invasive wetland species, as of October 11, 2001. The court also awards interest on those amounts at the ten-year Treasury STRIPS rate from these dates to the date the judgment is actually paid.

Final judgment to this effect shall be issued under Rule 54(b) of the Rules of the Court of Federal Claims because there is no just reason for delay. The clerk shall enter final judgment as specified.

In due course, the Commission may apply for an award of attorneys' fees and expenses under Section 304(c) of the Uniform Relocation Assistance Act, 42 U.S.C. § 4654(c). Proceedings related to any such request for attorneys' fees and costs shall be deferred until after any appellate process has been concluded or, alternatively, after the time for taking an appeal has expired.

It is so ORDERED.

s/ Charles F. Lettow
Charles F. Lettow
Judge

APPENDIX C

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2009-5121, 2010-5029

[Filed August 11, 2011]

ARKANSAS GAME & FISH COMMISSION,
Plaintiff-Cross Appellant,

v.

UNITED STATES,
Defendant-Appellant.

Appeals from the United States Court of Federal Claims in case no. 05-CV-381, Judge Charles F. Lettow.

ON PETITION FOR PANEL REHEARING AND REHEARING EN BANC

JULIE D. GREATHOUSE, Perkins & Trotter, PLLC, of Little Rock, Arkansas filed a petition for rehearing en banc for plaintiff-cross appellant. With her on the petition were JAMES F. GOODHART and JOHN P. MARKS,

Arkansas Game & Fish Commission, of Little Rock, Arkansas.

ROBERT J. LUNDMAN, Attorney, Environment & Natural Resources Division, United States Department of Justice, of Washington, DC, filed a response for defendant-appellant. With him on the response was IGNACIA S. MORENO, Assistant Attorney General. Of counsel was SAMBHAV N. SANKAR, Attorney.

Before RADER, *Chief Judge*, NEWMAN, LOURIE, BRYSON, GAJARSA, LINN, DYK, PROST, MOORE, O'MALLEY, REYNA, *Circuit Judges*, and WHYTE*, *District Judge*.

PER CURIAM.

DYK, *Circuit Judge*, with whom GAJARSA and LINN, *Circuit Judges*, join, concurs in the denial of the petition for rehearing en banc.

MOORE, *Circuit Judge*, with whom O'MALLEY and REYNA, *Circuit Judges*, join, dissents from the denial of the petition for rehearing en banc.

NEWMAN, *Circuit Judge*, dissents from the denial of the petition for rehearing en banc.

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* Honorable Ronald M. Whyte, District Judge, United States District Court for the Northern District of California, sitting by designation, did not participate in the decision of whether to rehear the appeal en banc.

ORDER

A petition for rehearing en banc was filed by Plaintiff-Cross Appellant, and a response thereto was invited by the court and filed by Defendant-Appellant. The petition for rehearing was referred to the panel that heard the appeals, and thereafter the petition for rehearing en banc and the response were referred to the circuit judges who are authorized to request a poll of whether to rehear the appeals en banc. A poll was requested, taken, and failed.

Upon consideration thereof,

IT IS ORDERED THAT:

(1) The petition of Plaintiff-Cross Appellant for panel rehearing is denied.

(2) The petition of Plaintiff-Cross Appellant for rehearing en banc is denied.

(3) The mandate of the court will issue on August 18, 2011.

FOR THE COURT

August 11, 2011
Date

/s/ Jan Horbaly
Jan Horbaly
Clerk

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2009-5121, 2010-5029

ARKANSAS GAME & FISH COMMISSION, *Plaintiff-Cross Appellant,*	)
v.	)
UNITED STATES, *Defendant-Appellant.*	)

Appeal from the United States Court of Federal Claims in case no. 05-CV-381, Judge Charles F. Lettow.

DYK, *Circuit Judge*, with whom GAJARSA and LINN, *Circuit Judges*, join, concurring in the denial of the petition for rehearing en banc.

Contrary to the dissents' characterization, the approach here was compelled by existing law established by settled Supreme Court and circuit precedent.

The Supreme Court has long required that we "distinguish[ ] between torts and takings." *See Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003) (citing *Barnes v. United States*, 538 F.2d 865, 870 (Ct. Cl. 1976)). A taking, involving a "permanent condition of continual overflow" or a

"permanent liability to intermittent but inevitably recurring overflows," *United States v. Cress*, 243 U.S. 316, 328 (1917), is distinct from a tort—an "injury [that] was in its nature indirect and consequential," *Sanguinetti v. United States*, 264 U.S. 146, 150 (1924).

In drawing this line, the "[Supreme] Court has consistently distinguished between flooding cases involving a permanent physical occupation . . . and cases involving a more temporary invasion." *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 428 (1982). "A taking has always been found only in the former situation." *Id.* Indeed, flooding only amounts to a taking when it "constitute[s] an actual, permanent invasion of the land, amounting to an appropriation of and not merely an injury to the property." *Sanguinetti*, 264 U.S. at 149.

Flooding constitutes this type of permanent invasion when there is a "permanent condition of continual overflow" or "a permanent liability to intermittent but inevitably recurring overflows." *Cress*, 243 U.S. at 328; *see also United States v. Kansas City Life Ins. Co.*, 339 U.S. 799, 809 n.8 (1950) (same). The Court in *Cress* expressly distinguished the "inevitably recurring" flooding in that case, which was caused by the erection of a lock and dam, from "a case of temporary flooding or consequential injury." 243 U.S. at 327. Moreover, our predecessor court consistently recognized that flooding must be inevitably recurring to constitute a taking. The Court of Claims has held that "[t]he plaintiff must establish that flooding will 'inevitably recur,' in the phrasing of the *Cress* case." *Nat'l By-Prods., Inc. v. United States*, 405 F.2d 1256, 1273, 1274 (Ct. Cl. 1969) (finding that plaintiff did not prove a taking because it "failed to

establish that the floodings . . . will inevitably recur"). Therefore, the Court of Claims has rejected takings claims when flooding was caused by a "temporary situation" which would not lead to the "inevitably recurring floodings which the Supreme Court stressed . . . in the *Cress* case." *Fromme v. United States*, 412 F.2d 1192, 1196–97 (Ct. Cl. 1969). "Government induced flooding not proved to be inevitably recurring occupies the category of mere consequential injury, or tort." *Ridge Line*, 346 F.3d at 1355 (quoting *Barnes*, 538 F.2d at 870).

The Court of Claims' decision in *Barnes* clearly illustrates this long-governing rule. In *Barnes*, the government released water from a dam starting in 1969, which caused flooding on plaintiffs' properties from 1969–1973 and again in 1975. 538 F.2d at 868–69. The government stipulated that the releases which caused the flooding would continue. *Id.* at 870. Based on the premise that the intermittent flooding would "continue indefinitely," the court found that the flooding was a taking because it "will be inevitably recurring." *Id.* at 870, 872. However, it held that the flooding could not constitute a taking until "the permanent character of [the] intermittent flooding could fairly be perceived," and it therefore denied recovery for crop damage sustained before 1973, which was when it could "be said with relative certainty that the flooding would be permanent." *Id.* at 873.

Here it was anything but "inevitable" that the government would continue the temporary policies that caused the flooding. The United States Army Corps of Engineers ("Corps") made a series of ad hoc and independent decisions to deviate from the normal release rates at a dam in Missouri, which sometimes

caused intermittent flooding on the plaintiff's property. The Corps' decisions about whether or not to deviate were made on a yearly basis. The Corps attempted to bring interested parties together to formulate a new release plan for the dam; however, the groups responsible were unable to agree on a long-term solution. *Ark. Game & Fish Comm'n v. United States*, 637 F.3d 1366, 1369–70 (Fed. Cir. 2011). As a result, multiple interim plans were adopted. *Id.* These multiple interim deviation plans were viewed by everyone involved, including the plaintiff, as "interim operating plan[s]." *Id.* at 1369–70, 1377–78.

Each interim plan differed from the next, as the Corps and interested parties tried different ideas and attempted to come to an agreement. *See id.* at 1369–71. Once the interested parties proposed a final plan, the Corps abandoned the concept of adopting a permanent deviation plan, returned to normal regulation, and never adopted a permanent change to the normal release rates. *Id.* at 1371. Under these circumstances, it could never "be said with relative certainty," *Barnes*, 538 F.2d at 873, that the deviations (and hence the flooding) would even occur the following year. It certainly could not be said that the flooding would inevitably recur.

Contrary to the dissents, the panel majority did not create a blanket rule under which any flood-causing policy that is labeled temporary by the government will allow the United States to avoid takings liability. A policy that in its inception is designed to be permanent but which is later terminated could lead to liability, just as liability could exist if a permanent condition were created and the land were later reclaimed. *See United States v. Dickinson*, 331 U.S.

745, 746–47, 751 (1947). The panel majority specifically held that "in other contexts the distinction between a temporary and permanent release plan may be difficult to define," and "[t]he government cannot . . . avoid takings liability by characterizing inevitably recurring events as merely a series of temporary decisions." *Ark. Game & Fish Comm'n*, 637 F.3d at 1379. If the government, with the objective of creating a permanent or recurring condition had pursued that goal by adopting fifty consecutive and identical one year deviations (Judge Moore's hypothetical), such action might properly be viewed as permanent or "inevitably recurring." Here, we have no such scenario. The temporary nature of the policies is more than simply a label placed on the policies by the government. Rather, it is clear that this was a situation in which there was genuine uncertainty about the nature of the policies from year to year as the Corps responded to individualized concerns and individualized circumstances over (in the aggregate) a short period of time. The government's actions and the surrounding context demonstrate that the policies were temporary and not inevitably recurring.

Therefore, given that settled Supreme Court and circuit precedent dictated the result, I concur in the court's refusal to rehear this case en banc.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2009-5121, 2010-5029

ARKANSAS GAME & FISH COMMISSION, *Plaintiff-Cross Appellant,*	)
v.	)
UNITED STATES, *Defendant-Appellant.*	)

Appeal from the United States Court of Federal Claims in case no. 05-CV-381, Judge Charles F. Lettow.

MOORE, *Circuit Judge*, with whom, O'MALLEY and REYNA, *Circuit Judges*, join, dissenting from the denial of the petition for rehearing en banc.

This Circuit is uniquely responsible under the Tucker Act for Fifth Amendment Takings claims. The majority's misapplication of Supreme Court Takings jurisprudence creates a bar to relief in cases involving flooding caused by Government action, cases in which established doctrine would otherwise provide Constitutional protection to private property. I respectfully dissent.

The majority in this case precludes the possibility of a takings claim due to flooding caused by

"temporary" government action regardless of the duration or severity of the condition. The majority holds that the only potential remedy is in tort. I disagree. An early Supreme Court decision, *United States v. Cress*, 243 U.S. 316, 328 (1916), handed down well before the development of the concept of 'temporary takings' as it is understood today, talked in terms of requiring that for flooding to constitute a taking, it must be "inevitably recurring." But that does not preclude the possibility that a government action labeled "temporary" could give rise to such "inevitably recurring" flooding. To allow the government's "temporary" label for the release rate deviations to control the disposition of this case elevates form over substance and leads to untenable results with enormous future consequences.

The key distinction today is whether the flooding at issue is a one time or incidental event, in which case the consequent injury is characterized as a tort, or whether the injury, substantial over time, is a continuing or recurring one and the predictable consequence of the Government's conduct. In the latter case, it is a taking. As we have explained: "The tort-taking inquiry in turn requires consideration of whether the effects . . . experienced were the predictable result of the government's action, and whether the government's actions were sufficiently substantial to justify a takings remedy." *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003).

The facts of this case are quite simple. Due to government action that caused eight years of intermittent flooding, the Arkansas Game and Fish Commission (Commission) lost more than $5 million

worth of timber. The Court of Federal Claims found that the effects of the flooding were predictable and that the government's actions were sufficiently substantial to justify a takings remedy. *Ark. Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 623 (2009). There is no error in this decision.

Reversing the trial court's decision, the majority begins its analysis with an acknowledgement of current doctrine: "If particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim." *Ark. Game & Fish Comm'n v. United States*, 637 F.3d 1366, 1374 (Fed. Cir. 2011) (citing *First English Evangelical Lutheran Church of Glendale v. County Of Los Angeles*, 482 U.S. 304, 328 (1987)). The majority goes on, however, to reject current doctrine as inapplicable to flooding cases. *Ark. Game*, 637 F.3d at 1374-75. The majority states that, unlike other types of takings, flooding due to government action must constitute a "permanent invasion" in order for the landowner to recover. *Id.*

I do not agree. The distinction is between torts and takings. This does not correlate, as the majority holds, to temporary and permanent. In short, I do not believe that every "temporary" action by the government which causes recurring flooding is compensable only under a tort theory. The majority tells us that to constitute a taking, rather than a tort, there must be substantial damage from "inevitably recurring" flooding. But, under the majority's rule, there can never be "inevitably recurring" flooding if the government action is *temporary*.

The majority holds that eight years of release rate deviations resulting in repeated annual overflow flooding (certainly recurring), cannot ever be a taking because each release rate deviation was an individual event with its own start and end date – they were each temporary. *Ark. Game*, 637 F.3d at 1369 (the release rate deviations were "only for limited periods of time" and "therefore the approved deviations were by their nature temporary."). Therefore, according to the majority, these release rate deviations do not give rise to the sort of "permanent invasion" required for a taking.

I do not agree. As an initial matter, it is clear that government action which results in only a temporary flooding can be a compensable taking. In *United States v. Dickinson*, 331 U.S. 745, 746-47 (1947), the government constructed a dam that led to persistent flooding on the plaintiffs' lands. *Id.* "At considerable expense . . . [plaintiff] reclaimed most of his land which the Government originally took by flooding." *Id.* at 751. Although the landowner reclaimed the land, the Supreme Court nevertheless held that the taking was compensable. *Id.* Hence, something less than permanent flooding can constitute a compensable taking. The majority agrees that there would have been a compensable taking if the release rate deviations that were passed were permanent, even if they were rescinded years later so that the Commission could reclaim its land.

With all due respect, there is no meaningful difference between that set of facts and this one. The government recognizes this incongruity. Gov't Resp. to Pet. For Reh. at 7 ("[I]f the Corps had approved a permanent deviation plan and then reversed course

ten years later, the situation would at least be much closer to a permanent change constituting a taking."). As we earlier made clear:

> [T]he government when it has taken property by physical invasion could subsequently decide to return the property to its owner, or otherwise release its interest in the property. Yet no one would argue that that would somehow absolve the government of its liability . . . All takings are 'temporary' in the sense that the government can always change its mind at another time.

Hendler v. United States, 952 F.2d 1364, 1376 (Fed. Cir. 1991). If a flowage easement which is terminated after eight years can be a compensable taking, why can't an eight year flowage easement or eight consecutive one year flowage easements?

Under the majority's rule, even if the government enacted 50 consecutive one year release rate deviations – such that the flooding had inevitably recurred for 50 years – these would still be temporary and no taking could be found. The Supreme Court has held that "it is the character of the invasion . . . that determines the question of whether it is a taking." *Cress*, 243 U.S. at 328. The fact finder must be able to, with the benefit of hindsight, determine the character of an invasion and find that the result is flooding that is "inevitably recurring." The author of the majority in this case agrees that 50 one-year deviations could amount to a taking because of their character of permanence. Concurrence at 4. With all due respect, the question of whether eight years of deviations are similarly adequate is best left to the fact finder – the Court of

Federal Claims. I cannot hinge the entire takings analysis, as the majority does, on the government's chosen label for the action – temporary or permanent.

The distinction between tort and takings in the flooding cases is not as easy as saying one flood is a tort and any more than that a taking. Nor is it as simple as the majority would have it – if the government action turns out to have had a limited duration it cannot be a taking. As our predecessor court explained:

> The Government has been liable where the construction of a dam or other obstruction in a stream results in either permanent flooding or a 'permanent liability to intermittent but inevitably recurring overflows.' But the courts have held that one or two or three floodings by themselves do not constitute a taking. The plaintiff must establish that flooding will 'inevitably recur', in the phrasing of the Cress case.
>
> The distinction between 'permanent liability to intermittent but inevitably recurring overflows,' and occasional floods induced by governmental projects, which we have held not to be takings is, of course, not a clear and definite guideline.

Nat'l By-Products, Inc. v. United States, 405 F.2d 1256, 1273, 74 (Ct. Cl. 1969) (citations omitted). Here there were eight years of inevitably recurring flooding caused by governmental action which has now been brought to an end. I think the Court of Federal Claims properly analyzed the eight years of release rate deviations and the recurring flooding that these caused

and determined that the character of this government action – this repeated, consistent flooding – constituted a taking.

Determining whether the government action in question is a tort or a taking requires a flexible case-by-case approach considering the character of the government action as a whole, the nature and extent of the flooding that was caused and the resultant damage that occurred. The Court of Federal Claims did just that. By contrast, the majority adopted a rigid, unworkable and inappropriate black letter rule – if the government action which causes flooding and substantial damage to a property holder is of limited duration it can never be a taking.

Because we miss the opportunity to correct this error of law, I respectfully dissent from the denial of en banc.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2009-5121, 2010-5029

ARKANSAS GAME & FISH COMMISSION, *Plaintiff-Cross Appellant,*	)
v.	)
UNITED STATES, *Defendant-Appellant.*	)

Appeal from the United States Court of Federal Claims in case no. 05-CV-381, Judge Charles F. Lettow.

NEWMAN, *Circuit Judge*, dissenting from denial of rehearing en banc.

I respectfully dissent from the denial of the Commission's petitions for rehearing and for rehearing en banc. As discussed with respect to the panel majority's decision, Fifth Amendment principles as explicated and applied by the Supreme Court, by the Federal Circuit and the Court of Claims, and here by the Court of Federal Claims, negate the reasoning and the result of the panel majority. *See Arkansas Game & Fish Commission v. United States*, 637 F.3d 1366, 1379 (Fed. Cir. 2011) (Newman, J., dissenting).

The Corps of Engineers ultimately agreed that its unilateral and protested flooding of the Arkansas Management Area was injurious, and because of this injury the Corps terminated its departure from the previously agreed release schedule of water from the Clearwater Dam. It was found at trial, and not disputed in this court's majority decision, that this flooding caused permanent injury and destruction of Management Area timber, destruction that was not reversible after the Corps finally ended its deviations. The panel majority's holding that this injury is not compensable, on the theory that injury caused by temporary floodings is *per se* never eligible for consideration as a "taking," is contrary to law and precedent, as reiterated in the accompanying dissent from denial of rehearing en banc.

Even the government is uncomfortable with the court's new rule, for in its brief responding to the Commission's petition, the government disingenuously announces that "the panel majority did not establish a *per se* rule." Gov't Response at 1. However, the panel majority did indeed establish a *per se* rule, stating that "because the deviations from the 1953 plan were only temporary, they *cannot* constitute a taking." *Arkansas Game & Fish Commission*, 637 F.3d at 1378-79. The panel majority also creates the new rule that it is not necessary to apply the balancing test elaborated in *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003), stating that "we need not decide whether the flooding on the Management Area was 'sufficiently substantial to justify a takings remedy' or 'the predictable result of the government's action' [quoting from *Ridge Line*] because the deviations were by their very nature temporary." 637 F.3d at 1376. This position is in conflict with Supreme Court

precedent, as summarized in *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 436 n.12 (1982): "As . . . the intermittent flooding cases reveal, such temporary limitations are subject to a more complex balancing process to determine whether they are a taking." See, for example, this court's treatment of analogous facts in *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987), where six years of intermittent flooding were caused by a Corps of Engineers construction project that clogged the river while the construction proceeded, and was held to be a "taking" of the destroyed timber, although the construction project and its effect on the river were always understood not to be permanent.

A judge of the majority opinion now proposes that "the panel majority did not create a blanket rule." (Dyk, J. concurring in the denial of rehearing en banc, at 4). However, a single judge cannot rewrite the words and change the ruling of the court's issued opinion. If anything, such an attempted qualification adds confusion, not clarity, to this precedential decision.

On its face, the court's ruling conflicts with extensive precedent, as well as strains constitutional principles. From the denials of rehearing and of rehearing en banc, I respectfully dissent.

APPENDIX D

28 U.S.C. § 1295(a)(3)

(a) The United States Court of Appeals for the Federal Circuit shall have exclusive jurisdiction--

. . .

(3) of an appeal from a final decision of the United States Court of Federal Claims;

28 U.S.C. § 1346(a)(2)

(a) The district courts shall have original jurisdiction, concurrent with the United States Court of Federal Claims, of:

. . .

(2) Any other civil action or claim against the United States, not exceeding $10,000 in amount, founded either upon the Constitution, or any Act of Congress, or any regulation of an executive department, or upon any express or implied contract with the United States, or for liquidated or unliquidated damages in cases not sounding in tort, except that the district courts shall not have jurisdiction of any civil action or claim against the United States founded upon any express or implied contract with the United States or for liquidated or unliquidated damages in cases not sounding in tort which are subject to sections

7104(b)(1) and 7107(a)(1) of title 41. For the purpose of this paragraph, an express or implied contract with the Army and Air Force Exchange Service, Navy Exchanges, Marine Corps Exchanges, Coast Guard Exchanges, or Exchange Councils of the National Aeronautics and Space Administration shall be considered an express or implied contract with the United States.

28 U.S.C. § 1491(a)(1), (c)

(a)(1) The United States Court of Federal Claims shall have jurisdiction to render judgment upon any claim against the United States founded either upon the Constitution, or any Act of Congress or any regulation of an executive department, or upon any express or implied contract with the United States, or for liquidated or unliquidated damages in cases not sounding in tort. For the purpose of this paragraph, an express or implied contract with the Army and Air Force Exchange Service, Navy Exchanges, Marine Corps Exchanges, Coast Guard Exchanges, or Exchange Councils of the National Aeronautics and Space Administration shall be considered an express or implied contract with the United States.

* * *

(c) Nothing herein shall be construed to give the United States Court of Federal Claims jurisdiction of any civil action within the exclusive jurisdiction of the Court of International Trade, or of any action against, or founded on conduct of, the Tennessee Valley Authority, or to amend or modify the provisions of the Tennessee Valley Authority Act of 1933 with respect to actions by or against the Authority.

33 U.S.C. § 702c

Except when authorized by the Secretary of the Army upon the recommendation of the Chief of Engineers, no money appropriated under authority of sections 702a and 702g of this title shall be expended on the construction of any item of the project until the States or levee districts have given assurances satisfactory to the Secretary of the Army that they will (a) maintain all flood-control works after their completion, except controlling and regulating spillway structures, including special relief levees; maintenance includes normally such matters as cutting grass, removal of weeds, local drainage, and minor repairs of main river levees; (b) agree to accept land turned over to them under the provisions of section 702d of this title; (c) provide without cost to the United States, all rights-of-way for levee foundations and levees on the main stem of the Mississippi River between Cape Girardeau, Missouri, and the Head of Passes.

No liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place: *Provided, however,* That if in carrying out the purposes of sections 702a, 702b to 702d, 702e to 702g, 702h, 702i, 702j, 702k, 702*l*, 702m, and 704 of this title it shall be found that upon any stretch of the banks of the Mississippi River it is impracticable to construct levees, either because such construction is not economically justified or because such construction would unreasonably restrict the flood channel, and lands in such stretch of the river are subjected to overflow and damage which are not now overflowed or damaged by reason of the construction of levees on the opposite banks of the river it shall be the duty of the Secretary of the Army

and the Chief of Engineers to institute proceedings on behalf of the United States Government to acquire either the absolute ownership of the lands so subjected to overflow and damage or floodage rights over such lands.

(May 15, 1928, c. 569, § 3, 45 Stat. 535.)

APPENDIX E

Hicklin, Roger C SWL

From:	Carter, Ken W SWL
Sent:	Friday, March 30, 2001 7:08 AM
To:	Hicklin, Roger C SWL
Subject:	FW: Update on the Clearwater Lake/Black River Control Plan

Sensitivity: Confidential

—Original Message—

From:	Melcher, David F SWD
Sent:	Thursday, March 29, 2001 4:36 PM
To:	Holden, Thomas A Col SWL
Cc:	Schultz, Michael L COL SWD; McClintock, Annie M SWL; Dunn, Donald M SWL; Bentley, Douglas L LTC SWL; Watford, Edward R SWL; Carter, Ken W SWL; Miller, Michael E SWL; Shuford, C E SWD; Dawson, William SWD
Subject:	RE: Update on the Clearwater Lake/Black River Control Plan
Sensitivity:	Confidential

OK, good plan for executing and informing the leadership. Drive on.

BG DAVID F. MELCHER
CDR, SW Division, USACE
PH: (214) 767-2502
David.F.Melcher@usace.army.mil
Http://www.swd.usace.army.mil

—Original Message—

From:	Holden, Thomas A Col SWL
Sent:	Thursday, March 29, 2001 1:28 PM
To:	David Melcher
Cc:	Michael Schultz; Annie McClintock; Donald Dunn; Douglas Bentley; Edward Watford; Ken Carter; Michael Miller; C Shuford; William Dawson
Subject:	Update on the Clearwater Lake/Black River Control Plan
Importance:	High
Sensitivity:	Confidential

Sir,

We are not able to continue moving the proposed 4' seasonal Clearwater Lake deviation. Our regulating stage is at Poplar Bluff and under this deviation we extend the duration of lower releases from Clearwater Lake which has significant impacts to the bottomland hardwoods in the Donaldson/Black River Wildlife Management area. This means we must revert to the approved release plan which is 10.5' at Poplar Bluff during the growing season and that is going to be contentious with the delegation; i.e. Congresswoman Emerson, Congressman Berry and both senators from Arkansas. Frankly, I expect both Congresswoman

Emerson and Congressman Berry to call you and headquarters, and possibly the senators.

Background:

- Since about 1975 we have routinely asked for some type of seasonal/event specific deviation to reduce releases and lessen the impact on agricultural lands in Missouri and Arkansas at congressional member and/or farming interests requests.
- Lower releases allows farmers to farm, particularly soybeans, on marginal lands, and they have thus increased profits and the area they farm.
- AG&F has objected in the past because they contend that we increase the flood duration of hardwoods and kill more trees this way, particularly during the growing season. They now have a study that shows this and we acknowledge the validity of their concerns.
- By chance, we had a rain event in March 2001 that replicated the proposed 4' deviation releases at Poplar Bluff for a period of 11 days. We went on site in the WMA to see what this deviation would do and we confirmed that AG&F contentions are correct. The flooding is more extensive than our modeling predicted and the duration is probably more.
- We can no longer issue a FONSI under the draft EA and must do an EIS to implement the deviation and of course develop mitigation/ construction solutions in the WMA. In essence, we can continue with the process under the limited scope we have addressed thus far, except we believe that the solutions will not be

doable for a variety of political and public concerns because ... (see next bullet)

- Our study (the proposed deviation) is a result of the Clearwater Lake/Black River Committee which spent several years working out a solution that met farming interest and tried to balance wildlife concerns. AG&F was a participant and did not object with the proposed deviation until we sent out the draft EA and draft plan for final coordination. Unfortunately the proposed deviation and EA only focused on finding solutions in the WMA and not in the farm lands to the north and south, hence a limited scope. In essence, we looked a solutions to farmland flooding during planting/growing/ harvesting season by only looking at managing flooding in the WMA and not at any solutions outside the WMA. Even if we continue and can get to a draft EIS and draft plan, the fact is this would only involve the WMA to solve problems outside the WMA and that would be a hard to sell now that we have evidence of significant impacts e.g. we will need structural solutions in the WMA.
- Additionally, we cannot continue with another SWD approved seasonal deviation under this proposed plan this year as we did last summer and be in compliance with NEPA. We need to revert to the original plan and work any deviations that come up on a case basis, but now balancing this with data that shows we are having long-term significant impacts at some levels such as 4-6' releases. So it is most probable AG&F will exercise their objections and prevent us from accommodating farming interests unless the political pressure gets too

great on them. Moreover, anyone could challenge us in that deviations are not in compliance with NEPA and enjoin us. Blissful ignorance of the preceding 25+ years no longer applies. So we are faced with lousy options and I decided in favor of following the law and face the public and congressional wrath.

Here's what I plan to do:

- Hugh Durham and select members of his AG&F staff will meet with me tomorrow to discuss the points above. I will explain that he will catch a lot of heat since his agency came up at a very late date with data that causes them to object after concurring originally. In Hugh's defense he commissioned a study very early in his tenure that his predecessor chose not to do. Regardless he'll get a lot of political flack.
- We will brief the delegation that we will enforce the original release plan and although we may consider deviation requests, the chances of those being favorably acted upon are remote given the data we have, and the risk of being enjoined. We will offer to meet with local interests with the delegation members/staff present and of course ask AG&F to participate where we will explain why we must do this and how we are developing a broader study to address the issue of releases. We are also going to have an extensive communication plan to get the word out. Our problem is simple, we cannot operate the project as originally approved without significant economic impacts to farmers. Thus I am going with provide delegation members with legislation for either an O&M add or a GI add and hopefully our

members will accept our position and get language and money to broaden the study to the Black River Basin to develop a deviation that balances all interests and of course complies with NEPA. In short, we must start the 2-3 year process over.

- I fully expect Congresswoman Emerson and Congressman Berry to jump on us and demand some type of Town Hall meeting in their districts to tell the farmers what we are about to do. Congressman Berry has used this tact on me before. I am also concerned that Senator Hutchinson will take advantage of this to weaken Congressman Berry politically since the congressman is being openly talked about as the democratic rival to the senator in 2002. We have had interesting inquiries from his staff on opportunities in the delta and other regions to strengthen his base in historically democratic voting regions.

I gave Mike Schultz a 30 minute detailed brief on this yesterday. I don't need assistance from SWD right now. However, if we do not get any member to add language and money, this is an unfunded mandate that I expect they will pressure you and Hqs to fix.

I did not cc MG Van Winkle but I will discuss this with him during my pre-congressional discussions next Monday.

V/R
TAHJ
Thomas A. Holden Jr.
Colonel, EN

Commander/District Engineer
(501) 324-5531, Fax (501) 324-5699
Thomas.A.Holden.COL@swl02.usace.army.mil
http://www.swl.usace.army.mil

APPENDIX F

Nos. 2009-5121, 2010-5029

In the United States Court of Appeals for the Federal Circuit

ARKANSAS GAME & FISH COMMISSION,

Plaintiff-Cross Appellant,

v.

UNITED STATES,

Defendant-Appellant.

Appeal from the United States Court of Federal Claims in 05-CV-381
Judge Charles F. Lettow

PRINCIPAL BRIEF OF DEFENDANT-APPELLANT UNITED STATES

IGNACIA S. MORENO
Assistant Attorney General

ROBERT J. LUNDMAN
United States Department of Justice
Environment & Natural Resources Division
P.O. Box 23795 (L'Enfant Plaza Station)
Washington, DC 20026
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* * *

[p.41]

deviations only slightly increased the amount of inundation of the Wildlife Management Area. As in *Sanguinetti,* the most that can be said is that the "injury was in its nature indirect and consequential, for which no implied obligation on the part of the government can arise." 264 U.S. at 150. Even assuming that the deviations caused an increase in flooding on the Wildlife Management Area, the Commission never established that the Corps should have predicted the increase when it started the deviations in 1993.

5. The cumulative assessment of the above factors establishes that no taking occurred here.

While each of the four considerations discussed above demonstrate that the CFC clearly erred in concluding that a taking occurred here, those individual considerations also should be weighed together. The correct question here is whether there is a taking where a non-permanent operational change

led at most to a marginal increase in summer flooding on forest land that already flooded regularly during the summer, that did not directly benefit the United States, and that was not foreseeable. The CFC dismissed each of these factors separately but never addressed the larger picture. That picture here reveals flooding that falls well short of the standard for a taking. At most, the Commission has a tort claim here, for which the CFC lacks jurisdiction.

* * *

[p.55]

could be tested.[12/]

CONCLUSION

For the foregoing reasons, the CFC should be reversed and the case remanded either with directions that judgment be entered in favor of the United States or, in the alternative, for further proceedings.

Respectfully submitted,

IGNACIA S. MORENO
Assistant Attorney General

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[12] Moreover, because the Commission and its experts lost the cruise maps, the United States was unable to assess the condition of the damaged trees to determine if, in fact, half had died as the Commission's expert had guessed.

/s/
ROBERT J. LUNDMAN
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January 2010
90-1-23-11556

OPPOSITION BRIEF

No. 11-597

In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION, PETITIONER

v.

UNITED STATES OF AMERICA

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF FOR THE UNITED STATES IN OPPOSITION

DONALD B. VERRILLI, JR.
Solicitor General
Counsel of Record
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QUESTION PRESENTED

The Court of Federal Claims found that during several years in the 1990s, temporary and irregular changes in water releases from a flood-control dam operated by the United States Army Corps of Engineers marginally increased the number of days on which part of petitioner's wetland property—which is located 115 miles downstream of the dam and has long been subject to regular natural flooding—was inundated. The question presented is as follows:

Whether the Corps' releases of water effected a Fifth Amendment taking of petitioner's property.

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In the Supreme Court of the United States

No. 11-597

ARKANSAS GAME & FISH COMMISSION, PETITIONER

v.

UNITED STATES OF AMERICA

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF FOR THE UNITED STATES IN OPPOSITION

OPINIONS BELOW

The opinion of the court of appeals (Pet. App. 1a-37a) is reported at 637 F.3d 1366. The opinions on denial of rehearing en banc (Pet. App. 165a-179a) are reported at 648 F.3d 1377. The opinion of the Court of Federal Claims (Pet. App. 38a-161a) is reported at 87 Fed. Cl. 594.

JURISDICTION

The judgment of the court of appeals was entered on March 30, 2011. A petition for rehearing was denied on August 11, 2011 (Pet. App. 162a-164a). The petition for a writ of certiorari was filed on November 9, 2011. The jurisdiction of this Court is invoked under 28 U.S.C. 1254(1).

STATEMENT

1. The Black River flows south from Missouri into Arkansas. Pet. App. 3a, 46a. In its pre-dammed state, the River regularly flooded lands along its banks. *Id.* at 59a-60a. The United States Army Corps of Engineers (Corps) constructed Clearwater Dam in Missouri in the 1940s to control flood waters from the River. *Id.* at 3a-4a, 46a. The Corps releases waters from Clearwater Lake behind the Dam into the River to serve a variety of interests, but the Corps cannot operate the Dam to completely eliminate downstream flooding. *Id.* at 3a-4a, 46a.

Petitioner owns and manages the Dave Donaldson Black River Wildlife Management Area (WMA), a region in Arkansas about 115 miles downriver from the Dam that spans 23,000 acres on both banks of the River. Pet. App. 2a-3a. The WMA has long been subject to regular flooding, both before and after the Dam was constructed. *Id.* at 7a, 14a-15a, 59a-60a, 106a. In addition, petitioner has created several "Green Tree Reservoirs" in the WMA, which it intentionally floods each year to facilitate duck hunting. Pet. 4; Pet. App. 44a. The WMA also serves as a timber resource. *Id.* at 3a, 42a-43a.

In 1953, the Corps adopted the Clearwater Lake Water Control Manual. Pet. App. 4a. Among other things, the Manual provided for "normal regulation" water releases from the Lake to the River below the Dam. These releases were keyed to the stage of the River (*i.e.*, the River's depth) at the Poplar Bluff gauge, which is in Missouri, about 32 miles downriver from the Dam. *Id.* at 5a, 46a. In particular, the Manual set maximum water release levels so that the River would measure no more than 10.5 feet at Poplar Bluff during the growing season and no more than 11.5 feet during the non-growing season. *Id.* at 5a. These maximum release levels "allowed

for the quick release of water during the growing season, so flooding occurred in short-term waves rather than over extended periods." *Ibid.*

The Manual also provided for deviations from the normal regulation releases for emergencies, unplanned minor deviations, and planned deviations requested for agriculture, recreational, and other purposes. Pet. App. 5a. Planned deviations were "for specific activities that required deviations only for limited periods of time, such as the harvesting of crops, canoe races, and fish spawning." *Id.* at 6a. The Corps approved a number of different deviations between 1993 and 1999. The deviations were not uniform: they applied at different times of the year, they provided for different water releases (as measured by the River's stage at the Poplar Bluff gauge), and they were in response to different requests. *Id.* at 6a-13a. For example, farmers along the River who needed more time to harvest crops before their lands flooded requested deviations. *Id.* at 6a. A working group of interested parties, including farming interests, also requested deviations that attempted to balance the various interests. *Id.* at 6a-9a. Although the deviations provided for releases that corresponded to the River's stage at Poplar Bluff, releases would also increase if Clearwater Lake reached certain levels. *Id.* at 11a.

This case concerns deviations in 1993 through 1998.[1] See Pet. App. 11a-13a (chart summarizing deviations). In particular:

- In 1993, farmers along the River requested that the Corps slow water releases to provide them more time to harvest their crops. Pet. App. 6a. The Corps approved a two-and-a-half month deviation from normal regulation releases, from September 29 to December 15. *Ibid.* That deviation set the maximum stage of the River at Poplar Bluff to 6 feet, as compared to the normal regulation stage of 11.5 feet. *Ibid.*
- In 1994, the Corps approved temporary deviations from April through November, in response to a proposal from a group of public and private entities that was working to build a consensus on permanent revisions to the Manual. Pet. App. 7a-8a. That deviation set the maximum stage at 11.5 feet for the first two weeks of April, then at 8 feet for the next month, and then at 6 feet from mid-May through November. *Id.* at 8a.
- In 1995, the Corps approved deviations that mirrored those in 1994. Pet. App. 8a.

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[1] The Corps also approved deviations in 1999 and 2000, but they did not affect the River's level because of drought conditions. Pet. 3; Pet. App. 15a, 61a, 75a. The Corps approved a deviation from December 1, 1998, to December 31, 1999, setting four feet as the maximum river stage at Poplar Bluff from mid-May though November, with that level increasing if the Lake filled to a certain volume. Pet. App. 9a. The Corps later approved the continuation of this deviation through December 1, 2000. That was the final deviation approved by the Corps. *Id.* at 10a.

- In 1996, the Corps approved new deviations, with target stages of 6 feet in June and 5 feet from July through November. Pet. App. 8a-9a.
- In 1997, the Corps approved a short deviation from June 3 to July 5 to prevent possible flooding. Pet. App. 9a.
- In 1998, the Corps approved a deviation from June 11 to November 30 in response to a request from agricultural interests. Pet. App. 9a.

The Corps also considered whether to permanently amend the Manual to change the normal regulation water release patterns. It participated in working groups of interested parties (including petitioner) weighing various options. Pet. App. 6a-10a. Although the working groups proposed some of the temporary deviations described above, they did not reach a consensus on permanent changes. *Id.* at 6a-9a. The Corps ultimately decided against any permanent changes to the Manual release patterns, after it had prepared an Environmental Assessment pursuant to the National Environmental Policy Act of 1969, 42 U.S.C. 4321 *et seq.* Pet. App. 9a-10a.

2. In 2005, petitioner sued the United States, claiming that the deviations in 1993 through 2000 increased growing-season flooding on the WMA and constituted a taking of petitioner's property under the Fifth Amendment. Pet. App. 13a. The flooding allegedly caused many trees to weaken and then die or decline during a 1999-2000 drought. Pet. 5; Pet. App. 13a, 15a. In response, the United States argued that petitioner's forest lands were already subject to regular growing-season flooding; that the releases had very little impact on the amount of flooding; that any increase in flooding did not

harm petitioner's trees; and that any increased flooding did not rise to the level of a taking. Pet. App. 13a-14a, 86a-87a.

Following a bench trial, the Court of Federal Claims found the United States liable for a taking of a temporary flowage easement over the WMA and awarded petitioner approximately $5.8 million in compensation for dead timber, declining timber, and restoration costs, plus interest. Pet. App. 38a-161a.

3. The court of appeals reversed. Pet. App. 1a-37a. The panel majority concluded that petitioner had failed as a matter of law to establish a taking of its property. The court's legal analysis focused on the longstanding distinction between government-caused flooding that constitutes only a tort and flooding that rises to the level of a taking. The court explained that tortious flooding results in "[a]n injury that is only 'in its nature indirect and consequential,'" *id.* at 18a (quoting *Sanguinetti* v. *United States*, 264 U.S. 146, 150 (1924)); by contrast, flooding that rises to the level of a taking consists of overflows that "'constitute an actual, permanent invasion of the land, amounting to an appropriation of and not merely an injury to the property,'" *ibid.* (quoting *Sanguinetti*, 264 U.S. at 149 (emphases omitted)). "[A]n invasion is permanent" under this Court's cases, the court of appeals explained, "when there is a 'permanent condition of continual overflow' or 'a permanent liability to intermittent but inevitably recurring overflows.'" *Id.* at 18a-19a (quoting *United States* v. *Cress*, 243 U.S. 316, 328 (1917)).

Here, the court of appeals concluded, any increased flooding in the WMA was an "inherently temporary condition" resulting from the Corps' "ad hoc or temporary" releases. Pet. App. 21a, 23a. The court stressed that

"all of the deviations from 1993 to 2000 were approved only as temporary or interim deviations. The multiple interim plans differed. Even where deviations were the same in consecutive years, such as in 1994 and 1995, the Corps had to approve an extension of the interim deviation plan for the second year." *Id.* at 24a. The court concluded that, because the deviations here "were plainly temporary * * * [and] cannot be characterized as inevitably recurring," they cannot constitute a taking and "at most created tort liability." *Id.* at 27a-28a.[2]

Judge Newman dissented. She would have held that the flooding constituted a taking because it was not of a "short duration" and it caused significant damage. Pet. App. 29a-37a.

4. The court of appeals denied rehearing en banc. Pet. App. 162a-179a. Concurring in the denial of rehearing, Judge Dyk (who had authored the panel majority opinion), joined by Judges Gajarsa and Linn, explained that the Corps "made a series of ad hoc and independent decisions to deviate from the normal release rates at a dam in Missouri, which sometimes caused intermittent flooding on the plaintiff's property." *Id.* at 167a-168a. "Each interim plan differed from the next, as the Corps and interested parties tried different ideas and attempted to come to an agreement." *Id.* at 168a. Judge Dyk further explained that the panel majority's decision was based on the factual circumstances here, and rejected the notion that it had created a blanket rule based on the label affixed to the government policy. *Id.* at 168a-169a.

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[2] The court of appeals did not comment further on a tort theory of recovery, presumably because petitioner had brought no such claim and the Court of Federal Claims' jurisdiction does not extend to cases "sounding in tort," 28 U.S.C. 1491(a)(1).

Judge Moore, joined by Judges Newman, O'Malley, and Reyna, dissented from the denial of rehearing en banc and expressed her view that the panel had permitted "the government's 'temporary' label for the release rate deviations to control the disposition of this case," yet doing so "elevates form over substance and leads to untenable results with enormous future consequences." Pet. App. 171a. While Judge Moore would have held that a "one time or incidental event" is properly characterized as a tort, in her view any "injury, substantial over time, [that] is a continuing or recurring one and the predictable consequence of the Government's conduct" should be treated as a taking. *Ibid.*

Judge Newman also issued an opinion dissenting from the denial of rehearing en banc, in which she reiterated her view that the flooding effected a taking because of its duration and the damage it caused. Pet. App. 177a-179a.

ARGUMENT

The court of appeals' decision is correct and faithfully analyzes the Corps' temporary and ad hoc water releases under this Court's longstanding principles distinguishing between mere temporary flooding episodes and the sort of continuous or inevitably recurring flooding that rises to the level of a taking. Petitioner does not suggest the decision below conflicts with any decision of another court of appeals or a state court of last resort. Petitioner's assertion (Pet. 20) that the court of appeals adopted a rigid "one-factor rule for flooding" cases both misreads the court's opinion and exaggerates the practical effect of the decision below. And in any event, a central evidentiary dispute that the court of appeals left unresolved makes this case a particularly unattractive vehicle: below, the government advanced

serious challenges to the Court of Federal Claims' approach to expert testimony on the actual effect of the Corps' deviations in its operation of the Dam on flooding in the WMA, more than 100 miles downriver. Further review is not warranted.

1. a. The decision of the court of appeals is correct. In *Loretto* v. *Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982), this Court summarized its flooding cases and explained that the "permanence" of the government action distinguishes between flooding that is a taking and flooding that causes non-taking damage. *Id.* at 435 n.12. The Court has "consistently distinguished between flooding cases involving a permanent physical occupation, on the one hand, and cases involving a more temporary invasion, or government action outside the owner's property that cause consequential damages within, on the other. A taking has always been found only in the former situation" *Id.* at 428 (citing cases). *Loretto* quotes *Sanguinetti* v. *United States*, 264 U.S. 146 (1924), as controlling in the flooding context: "to be a taking, flooding must 'constitute an actual, permanent invasion of the land, amounting to an appropriation of, and not merely an injury to, the property.'" 458 U.S. at 428 (quoting 264 U.S. at 149).

Under this test, permanence is established by either a "permanent condition of continual overflow" or "a permanent liability to intermittent but inevitably recurring overflows." *United States* v. *Cress*, 243 U.S. 316, 328 (1917). The former type of permanent flooding is typified by inundation of lands as a river or reservoir rises behind a newly constructed dam. See, *e.g.*, *United States* v. *Dickinson*, 331 U.S. 745, 746-747 (1947) (construction of a dam raised the river level, "permanently flood[ing]" some of the claimant's land). That type of

permanent flooding is not at issue here because it is undisputed that floods in the WMA always receded. The latter type of flooding is typified by construction that alters a waterway or land in a way that overflows or precipitation are consistently channeled onto servient property. See, *e.g.*, *Cress*, 243 U.S. at 318 (district court found "by reason of the erection of [a] lock and dam," the claimant's property became "subject to frequent overflows of water from the river, so as to depreciate it one-half of its value"); *Ridge Line, Inc.* v. *United States*, 346 F.3d 1346, 1350-1352 (Fed. Cir. 2003) (use of impervious surfaces construction of Postal Service facility that caused storm water runoff, forcing shopping center operator to construct large water detention facilities, could rise to the level of a taking). The court of appeals considered that type of flooding in this case.

The record here established, without contradiction, that the Corps' deviations were each conceived and implemented as temporary, and varied in their timing and reasons: "[A]ll of the deviations from 1993 to 2000 were approved only as temporary or interim deviations. The multiple interim plans differed. Even where deviations were the same in consecutive years, such as in 1994 and 1995, the Corps had to approve an extension of the interim deviation plan for the second year." Pet. App. 24a. In turn, the court of appeals correctly concluded that because the deviations were "inherently temporary," any flooding they caused could not be "inevitably recurring" in the way this Court's precedents demand. *Id.* at 25a.

That result is dictated by *Sanguinetti* itself. There, the Court found no taking where plaintiff's agricultural land was subjected to increased flooding for several years due to a government canal unintentionally de-

signed with insufficient capacity. *Sanguinetti*, 264 U.S. at 146-150. The state of affairs in *Sanguinetti* resulted in several years of flooding, but it was too temporary in nature to amount to a taking and did not "constitute an actual, permanent invasion of the land." *Id.* at 149. The court of appeals reached the same conclusion on similar facts here: the ad hoc operational changes did not effect the requisite "permanent invasion" of petitioner's land. Indeed, the nature of the flooding and the varied deviations here were more temporary and ad hoc than the government action in *Sanguinetti*, where a government-built structure caused flooding for several years.

b. Petitioner contends (Pet. 3, 10, 16) that the court of appeals' opinion articulates a per se rule that government action that causes flooding but is labeled "temporary" can never constitute a taking. As an initial matter, even if that accurately characterized the court of appeals' opinion, it would not call for this Court's review, because "[t]his Court * * * reviews judgments, not statements in opinions." *Black* v. *Cutter Labs.*, 351 U.S. 292, 297 (1956). And in any event, the court of appeals did not profess to create a per se rule. Rather, the court detailed the facts of the case at length, and its analysis recognized and appropriately emphasized that the particular deviations here were—in substance, not merely in name—"temporary" and "ad hoc." Pet. App. 6a, 10a-11a, 21a, 23a.[3]

Judge Dyk, the author of the panel majority opinion, made clear in his opinion concurring in the denial of re-

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[3] Petitioner's preferred label—that the Corps imposed a "regime" (Pet. 1, 3)—is incorrect. The record establishes that the Corps made distinct decisions to approve deviations for different time periods, releasing different amounts of water, in response to different requests. Pet. App. 6a-13a.

hearing that the court had not established a per se rule. "[T]he panel majority did not create a blanket rule under which any flood-causing policy that is labeled temporary by the government will allow the United States to avoid takings liability." Pet. App. 168a. Rather, the decision was based on the facts of this case:

> [I]t is clear that this was a situation in which there was genuine uncertainty about the nature of the policies from year to year as the Corps responded to individualized concerns and individualized circumstances over (in the aggregate) a short period of time. The government's actions and the surrounding context demonstrate that the policies were temporary and not inevitably recurring.

Id. at 169a.

Nor is petitioner correct in asserting (Pet. 10; see Pet. App. 171a) that the panel simply deferred to the government's label for the Corps' action. It was the substance of the decisions surrounding each of the irregular deviations, not an arbitrary label, that established their temporary and ad hoc nature. Nothing in the record suggests the deviations were anything but temporary; the Water Control Manual provided for such temporary deviations, and the Corps approved deviations that were limited in duration, varied in the concerns they were devised to address, and varied from year-to-year as to the time period during which the deviation would be allowed. *Id.* at 6a-13a. Moreover, the Corps considered and rejected permanent changes to the water release protocol, underscoring that the deviations it did approve were limited in duration. *Id.* at 9a-10a.

To be sure, the court of appeals did not find it necessary in the circumstances of the case to address other

factors that may inform whether the government has taken a flowage easement, such as whether the flooding was substantial, predictable, or destroyed the land's usefulness. See, *e.g.*, *Sanguinetti*, 264 U.S. at 150 (assessing extent of flooding); *United States* v. *Lynah*, 188 U.S. 445, 470 (1903) ("Where the government by the construction of a dam or other public works so floods lands belonging to an individual as to substantially destroy their value there is a taking within the scope of the Fifth Amendment."); *Pumpelly* v. *Green Bay & Miss. Canal Co.*, 80 U.S. 166, 181 (1871) ("[W]here real estate is actually invaded by superinduced additions of water, earth, sand, or other material, or by having any artificial structure placed on it, so as to effectually destroy or impair its usefulness, it is a taking."); *Ridge Line*, 346 F.3d at 1355. But that does not show that the court of appeals erred in concluding that the varied deviations here were too ephemeral—all lasting less than a year and differing in timing, water release levels, and the concerns they were meant to address—to constitute a taking. Rather, it simply illustrates what this Court has long held: mere episodes of temporary flooding are not a taking.

2. The decision below follows this Court's precedents and does not reflect a division of authority in lower courts.

a. The court of appeals quoted and applied this Court's caselaw addressing flood-based takings claims, appropriately focusing on the requirement—repeated throughout the Court's cases—that a degree of "permanence" is required to find a flood-caused taking. See pp. 9-11, *supra*. Petitioner nonetheless argues that the court of appeals' decision is inconsistent with the Court's takings precedents outside the context of flooding.

i. Petitioner argues (Pet. 13-17) that the decision below is inconsistent with so-called temporary takings doctrine. That is incorrect for three distinct reasons. First, recognizing that a government action must pass a threshold of permanence or duration is not inconsistent with this Court's recognition of temporary takings in the regulatory context and elsewhere. Although that threshold for a temporary taking is, of course, lower than for a permanent taking, that does not render irrelevant the contemplated duration of the government's interference with property. To the contrary, considering "permanence" in that sense is particularly appropriate in the flooding context, where flood waters frequently come and go, as this Court has long recognized. See, *e.g.*, *Loretto*, 458 U.S. at 428; *Sanguinetti*, 264 U.S. at 149.

Second, contrary to petitioner's contention (Pet. 11-12), the court of appeals did not rule out the possibility that the government could be found to have temporarily taken a flowage easement. See Pet. App. 168a-169a. Rather, the court found that had not occurred on the particular facts here. There are at least two ways in which a property owner might establish a temporary taking of a flowage easement. First, the government could undertake what was contemplated as a permanent action, but then later reverse course. Cf. *First English Evangelical Lutheran Church* v. *County of L.A.*, 482 U.S. 304, 318-319 (1987) (holding that abandonment or reversal of government action does not remedy a taking). Second, the government could engage in a series of nominally temporary identical actions (such as a decade-long series of identical deviations) that in substance can only be fairly viewed as an indefinite—and thus effectively permanent—action leading to "inevitably recurring" flooding. See Pet. App. 169a. Neither oc-

curred here, but the court of appeals' opinion forecloses neither theory in a proper case.

Third, the temporary takings cases on which petitioner relies (Pet. 13-14) cannot overcome this Court's consistent takings precedents addressing issues peculiar to flooding, because none of those decisions addressed flooding. For example, in *United States* v. *Causby*, 328 U.S. 256 (1946), the Court found that low-altitude government flights over a chicken farm imposed a servitude and remanded the case to determine if the easement was temporary or permanent. *Id.* at 258. *Causby* involved the direct invasion of plaintiff's property by government instrumentalities, rather than the indirect effects of waters passing through a dam more than a hundred miles upriver. That indirectness, typical of flooding cases but especially evident here, triggers a more heightened scrutiny of the permanence of the government action. See, *e.g.*, *Loretto*, 458 U.S. at 428. Although *Causby* stands for the proposition that the government can in some circumstances take a temporary easement, it does not address the duration or degree of permanence necessary for such an easement; in *Causby*, the number of temporary and ad hoc authorizations of flights over the plaintiff's farm that might have effected a taking was beside the point because all agreed there were "frequent and regular flights of army and navy aircraft over respondents' land." 328 U.S. at 258.

In effect, petitioner is asking this Court to discard its long line of precedents refusing to recognize a taking when the government's temporary actions cause a passing flood or floods. Cf. Pet. App. 23a ("[Petitioner's] entire theory is contrary to governing law."). That is apparent from the logical implication of petitioner's position, which is that if a temporary flood results from a

single deviation—or, for that matter, from any other short-term government decision—then the government has effected a temporary taking of the flooded property. Even if that result could be reconciled with the Court's cases from other strands of takings doctrine, it is incompatible with cases like *Sanguinetti* that refuse to find a taking as a result of every government-caused flood.

ii. Petitioner also argues (Pet. 1, 15-16) that the court of appeals erred because it did not balance various factors before holding that no taking occurred. But no decision of this Court requires the balancing in all cases of the permanence of the governmental action against other possible considerations, such as the substantiality of the flooding or the consequential damage to the property owner. Rather, the rule from *Sanguinetti* is that the governmental action can be a taking only if it "constitute[s] an actual, permanent invasion of the land, amounting to an appropriation of, and not merely an injury to, the property." 264 U.S. at 149. That test demands at least some threshold quantum of permanence to the governmental action, and if it is absent (as it was here), then a court should decline to find a taking.

b. Significantly, petitioner does not contend there is any division of authority in lower courts over takings doctrine as applied to flooding. Petitioner implies that no split is to be expected in light of the "Federal Circuit's exclusive jurisdiction," Pet. 22 n.2; see Pet. 12 n.1, but that misconceives the breath of circumstances in which flooding cases may arise. Any number of activities by state and local authorities—such as management of reservoirs and operation of sewage systems—could cause flooding and, potentially, effect a taking. A takings claim arising in that context would ordinarily be heard in the first instance in state court because "tak-

ings claims [against state and local governments] are not ripe [for litigation under the Federal Constitution] until a State fails 'to provide adequate compensation for the taking.'" *San Remo Hotel, L.P.* v. *City & County of S.F.*, 545 U.S. 323, 327 (2005) (quoting *Williamson County Reg'l Planning Comm'n* v. *Hamilton Bank*, 473 U.S. 172, 195 (1985)). Such cases, in the unlikely event they were decided on the merits in federal court at all (see *id.* at 346), would be heard on appeal to the regional courts of appeals. Yet petitioner does not contend the Federal Circuit's decision here conflicts with the decision of another court of appeals or a state court of last resort.

3. Petitioner, joined by its amici, expresses concern that under the court of appeals' decision, "the government may temporarily manipulate flooding regimes to * * * cause substantial, foreseeable damage to others without ever paying just compensation," by "refus[ing] to make a decision on how it will act even one year from now." Pet. 21. That concern is exaggerated, in both a legal and a practical sense.

From a legal standpoint, as the author of the panel majority opinion pointed out, a series of nominally temporary but substantively identical deviations "might properly be viewed as permanent or 'inevitably recurring,'" and thus support a takings claim. Pet. App. 169a (Dyk, J., concurring in denial of rehearing en banc). Here, "there was genuine uncertainty about the nature of the policies from year as the Corps responded to individualized concerns." *Ibid.* That limited holding would not immunize the government from liability for the sort of scheme petitioner seems to hypothesize.

From a practical standpoint, the "temporary" decisions that petitioner and its amici criticize are the excep-

tion, and they do not threaten to become the rule, for reasons wholly separate from takings law. The procedural requirements of various environmental laws tend to cause the Corps (and other governmental actors) to make deliberate long-term decisions about how water flows will be regulated; any flooding that results from such long-term decisions would likely be regarded as "permanent" and thus could be a compensable taking under appropriate circumstances. For example, the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.*, requires the Corps to prepare an Environmental Impact Statement for every major action that will significantly affect the quality of the environment, see 42 U.S.C. 4332(C). Similarly, the Endangered Species Act of 1973 (ESA), 16 U.S.C. 1531 *et seq.*, may require the preparation of a Biological Assessment by the Corps and a Biological Opinion by the Fish and Wildlife Service (including, potentially, a Reasonable and Prudent Alternative that allows the Corps to implement its action without jeopardizing an endangered species), see 16 U.S.C. 1536. See generally *In re Operation of the Mo. River Sys. Litig.*, 421 F.3d 618 (8th Cir. 2005) (discussing ESA and NEPA requirements related to Corps' operation of flood control and irrigation project), cert. denied, 547 U.S. 1097 (2006). Those procedures necessarily require the Corps to articulate with some particularity how it proposes to operate a project so that the Corps and other agencies can evaluate the effects of its proposed course of action. That process in turn lends a relative permanence to most significant decisions affecting water project management.

4. Finally, even if this Court were inclined to disagree with the court of appeals' analytical approach, this would be a poor vehicle for addressing the question pre-

sented because of the presence of a fundamental threshold evidentiary issue about the actual extent of marginal flooding created by the Corps' deviations.

a. All agree that the WMA is subject to natural flooding at various times of the year (see, *e.g.*, Pet. App. 7a, 14a-15a, 59a-60a, 106a), so a central factual issue at trial was whether and to what extent the Corps' deviations at the Dam caused a marginal increase in the number of days each year that the affected parts of the WMA were inundated, relative to the situation that would have obtained had the Corps' adhered to the normal regulation flows provided in the Manual. That is a challenging question to answer because the deviations and normal regulation flows were not specified in terms of days of inundation in the WMA nor even in terms of stage of the River at the WMA, but instead in terms of stage of the River at the Poplar Bluff gauge, some 83 miles upriver of the WMA. Although deviations as measured at Poplar Bluff at one time of the year could, depending on precipitation levels and subsequent water releases, affect whether parts of the WMA experienced extended inundation weeks or months later, considerable analysis is needed to determine if such an effect was *de minimis* or substantial.

The Court of Federal Claims' analysis of that factual issue was fundamentally flawed. That court relied on petitioner's expert witnesses, whose opinions focused on comparisons between historical measurements of the River's stage in the vicinity of the WMA in 1981-1992 (before the deviations) and measurements in 1993-2000 (during the deviations). See Pet. App. 61a-62a. Such a limited analysis fails to control for other variables affecting the River, such as precipitation levels, which can vary greatly year-to-year. See Gov't C.A. Br. 31. Worse

yet, simply inventorying the number of days the River is above a certain stage (as petitioner's experts did) does not answer the question of when the relevant areas of the WMA were inundated, because riparian land takes time to drain after a river crests, so a small number of evenly spaced high-water days can leave land continuously inundated in a way that a cluster of high-water days will not. See *id.* at 33.

The correct approach would be to ask what would have happened to the River's stage near the WMA had the deviations not occurred (while keeping other things from the 1993-2000 period constant), and then to translate river stages into duration of inundation. The government offered expert testimony on the first step through a computer simulation of what would have happened in 1993-2000 absent the deviations. See Pet. App. 62a-63a; Gov't C.A. Br. 34-35. Then for the second step, the government adopted petitioner's assumptions about drainage time in the WMA to translate the simulated river stages into duration of inundation. See Pet. App. 111a-112a; Gov't C.A. Br. 34-35. The governments' experts' conclusion was that "there would have been significant periods of timber inundation even in the absence of the Corps' deviations." Pet. App. 112a (quotation marks omitted); see Gov't C.A. Br. 35 & n.6.

The Court of Federal Claims nonetheless accepted petitioner's experts' testimony. The court concluded that the "River experienced more high water during the growing seasons from 1993 to 1999, *i.e.*, the period of [deviations], than it experienced during previous time periods." Pet. App. 107a. But even if true, that comparison is irrelevant to whether (or to what extent) the Corps' deviations caused the high water. By contrast, the government's experts' computer model spoke to that

key question, yet the Court of Federal Claims rejected that testimony without offering a sound reason for doing so. The court's apparent rationale for rejecting the model—that it "should [not] be employed to displace actual observations" of high water in the WMA in the 1990s, *id.* at 113a—misunderstands that the very purpose of the model was to supply a scientifically grounded prediction for what could not be observed, *i.e.*, river stages in the 1990s in the absence of the Corps' deviations.

b. The government raised the foregoing issue on appeal, see Gov't C.A. Br. 31-37, but the Federal Circuit did not resolve it, concluding that even accepting the Court of Federal Claims' findings about the effects of the Corps' deviations, those deviations did not rise to the level of a taking. This Court should not undertake a review of whether the court of appeals' decision was insufficiently attentive to the extent and duration of marginal inundation without first addressing the soundness of the Court of Federal Claims' findings on the subject. Petitioner proposes that this Court sidestep any such problem by not actually deciding the case, but instead simply "instruct[ing] the Federal Circuit to consider all the facts and apply [a] complex balancing test." Pet. 23. But that is tantamount to an admission that this case does not lend itself to rendering a definitive decision. A far better vehicle for considering the legal issue petitioner would present would be a case in which the cause and effect of the government's release of water were clear and close at hand—and not, as here, disputed and separated by 115 miles of river.

CONCLUSION

The petition for a writ of certiorari should be denied.

Respectfully submitted.

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MARCH 2012

REPLY BRIEF

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BRIEFS

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No. 11-597

In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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In opposing certiorari, the United States works hard to muddy the cleanly presented and dispositive legal question presented in the Arkansas Game & Fish Commission's ("Commission's") Petition, while taking creative license with the story of what it did to the Commission. Despite its efforts, this case squarely presents the issue of whether the government may foreseeably cause massive, permanent damage in the face of repeated objections without paying just compensation simply because its actions are not permanent. If the answer is "no," then the Federal Circuit's decision cannot stand and this case should be remanded for the Federal Circuit to apply the established balancing test. Pet. 11. That test, as Judge Newman described it, looks at all the circumstances to decide "whether the increased flooding caused significant injury before the flooding was abated, such that, on balance, the Fifth Amendment requires just compensation." Pet. 9 (quoting App. 36a (Newman, J., dissenting)).

I. There Are No Material Disputes of Fact Burdening the Question Presented.

The United States agrees that the Federal Circuit's permanency rule is an outcome-determinative legal requirement. *E.g.*, Opp. 12-13 (arguing that the Federal Circuit properly refused to consider anything else because "mere episodes of temporary flooding are not a taking"). Whether described as a "requirement" (Opp. 13), a "threshold" (Opp. 14), or a *per se* rule, permanency was the only factor considered. That one-factor analysis allowed the panel majority to hold that the government does not owe just compensation for destroying and damaging timber through six years of government-induced flooding because its actions were

not permanent. *E.g.*, App. 22a, 27a. To discourage this Court's review of that rule, the United States labors to make the Commission's legal challenge seem unattractive by presenting imagined factual disputes. The United States even reinvents the question presented as a merits question. None of those disputes burden the question presented.

The United States sets up a straw-man fact argument that the Commission has only challenged the deviations as being "labeled" temporary. Opp. 12. This is a false distraction. The Commission has always conceded, even at oral argument before the panel, that the actions themselves were substantively temporary. *E.g.*, App. 23a-24a, 48a-52a, 82a. While the Commission does not agree with the United States' sterilized characterization of its actions,[1] the dispute is immaterial here. The Commission has never argued that the Corps's actions were permanent.

---

[1] For example, the United States repeatedly describes the Corps's water release deviations between 1993 and 2000 as "ad hoc and independent decisions" (Opp. 7) that were "not uniform" (Opp. 3), were "varied in timing and reasons" (Opp. 10), and amounted only to "mere episodes of temporary flooding" (Opp. 13). *See also* Opp. 11 & n.3. In truth, the Court of Federal Claims found that the Corps implemented a protested "series of deviations" throughout the 1993-2000 period (App. 48a, 50a), many of which it admits were granted for "farmers who plant low-lying acreage downstream of Clearwater Dam" (App. 48a), creating a unique "pattern" of increased flooding on the Commission's management area, especially during the growing seasons when the trees cannot tolerate it (App. 50a, 52a, 85a, 107a). Judge Lettow rejected the idea that the deviation actions were "isolated invasions that might merely constitute a tort." App. 89a, 107a-108a, 114a.

The United States also says that an "unresolved" evidentiary dispute "makes this case a particularly unattractive vehicle." Opp. 8. The dispute it cites is not a question of whether certain evidence should have been admitted, but only whether Judge Lettow correctly weighed competing expert testimony at trial. *E.g.*, Opp. 20. That dispute is immaterial for at least two reasons. One, the panel majority did not consider the questions of causation and whether the flood invasions were "'sufficiently substantial.'" App. 16a, 22a. The panel majority looked only at whether the government's actions were temporary or permanent. App. 23a. Two, the United States does not at all describe the situation correctly. The United States' SUPER model was "far from unassailable." *E.g.*, App. 112a. Even the Corps admitted that the "flooding is more extensive than our modeling predicted and the duration is probably more." App. 99a, 186a. As Judge Lettow found, the increased flooding on the Commission's property was significant, not marginal, and the resulting timber damage was not indirect and consequential, but foreseeable as the direct, natural, and probable result of the Corps's actions. *Compare, e.g.*, Opp. (I), 15, 16, 19, 21 *with, e.g.*, App. 31a-32a, 92a, 99a, 102a, 114a. He did not rely solely on the Commission's experts like the United States suggests (Opp. 19). Judge Lettow cited the United States' *own* expert testimony that "'[t]he Corps's deviations resulted in substantial additional flooding on the [Management Area] . . . .'" App. 111a; *see also* App. 185a. He found that testimony to be "[p]erhaps the most dramatic evidence in this regard . . . ." App. 111a.

The Commission asks this Court to reverse the Federal Circuit's decision because it considered

nothing but the permanency of the government's actions. The court of appeals can then resolve the United States' disputes about the findings of fact that Judge Lettow rendered in his lengthy opinion after hearing from eighteen witnesses at a two-week trial, a site visit, pre- and post-trial briefing, and post-trial argument. Although the United States says that asking this Court to remand makes this case "unattractive," the Court frequently reviews cases to resolve a key constitutional dispute before remanding to address the merits. *E.g.*, *Phillip Morris USA v. Williams*, 549 U.S. 346, 357-58 (2007); *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1031 (1992). This case presents an unburdened legal question of whether the Federal Circuit's permanency rule preserves the protections guaranteed in the Takings Clause.

II. The Court Should Clarify the Scope of Takings Clause Protections for Non-Permanent Invasions.

The United States exposes just how u[illegible]precedented the Federal Circuit's permanency rule truly is. It argues that cases like *Sanguinetti v. United States*, 264 U.S. 146 (1924), actually *require* the Federal Circuit to wholly ignore the massive and foreseeable damage that the United States inflicted in the face of repeated objections and warnings. *See* Opp. 10 ("That result is dictated by *Sanguinetti* itself."). The United States stretches *Sanguinetti* far beyond its bounds. That it and the Federal Circuit could infer such a rule confirms that this Court's review is needed to clarify that permanency cannot be the sole factor.

The United States' argument that the Court in *Sanguinetti* saw no taking because the flooding "was

too temporary in nature" (Opp. 11) rests entirely on isolated dicta. The temporal aspect of floods there was simply not the only relevant factor. *Sanguinetti* also considered that the amount of permanent damage was not shown; the landowner had not lost the "customary use of the land" except for short periods of time; and the flooding was neither "the direct or necessary result of the structure" nor "within the contemplation of or reasonably to be anticipated by the government." *See Sanguinetti*, 264 U.S. at 149-50 (1924). Here, even the United States admits that the Federal Circuit refused to consider anything but the duration of the government's actions because it deemed anything else *irrelevant* to its analysis. Opp. 16(ii); *see also* App. 22a.

The United States' mislaid focus on *Sanguinetti* ignores the conflicting Federal Circuit precedent that is the most factually and legally analogous to the takings claim made by the Commission. *See Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987) (awarding compensation for timber destroyed by temporary, government induced flooding). The out-of-context dicta the United States cites from *Sanguinetti* conflicts with the Federal Circuit's own decision in *Cooper* and with the bedrock Takings Clause rules this Court has applied in numerous cases like:

- *Pumpelly v. Green Bay Co.*, 80 U.S. (13 Wall.) 166, 178 (1871) (reasoning that to so narrowly construe the Takings Clause as to let the government permanently damage property through floods without any compensation "would pervert the constitutional provision into a restriction upon the rights of the citizen, as those rights stood at the common law, instead of

the government, and make it an authority for invasion of private right under the pretext of the public good");

- *Causby v. United States*, 328 U.S. 256, 261 (1946) ("It is the owner's loss, not the taker's gain, which is the measure of the value of the property taken.");

- *United States v. Dickinson*, 331 U.S. 745, 748 (1947) ("The Fifth Amendment expresses a principle of fairness . . . .");

- *Kimball Laundry Co. v. United States*, 338 U.S. 1, 14 (1949) (pointing out that a temporary, "year to year" invasion deprives the plaintiff of certainty as to when it can go back to operating its business without interference, so that "[t]here was nothing it could do, therefore, but wait");

- *Armstrong v. United States*, 364 U.S. 40, 49 (1960) ("The Fifth Amendment's [Takings Clause] . . . was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.");

- *Penn-Central Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1976) (eschewing any "set formula" for determining when "justice and fairness" require compensation by the government under the Takings Clause and holding that when engaging in "essentially ad hoc, factual inquiries," significant factors to consider include (1) the character of the

governmental action, (2) the economic impact of government regulation on the claimant and, particularly, (3) the extent to which the regulation has interfered with distinct investment-backed expectations);

- *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 436 (1982) ("Although deprivation of the right to use and obtain a profit from property is not, in every case, independently sufficient to establish a taking, it is clearly relevant.") (internal citations omitted); and

- *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302, 337 (2002) (recognizing that the "temporary nature" of a property restriction "should not be given exclusive significance one way or the other").

Until now, no case has ever held that regardless of the damage or other circumstances, the government can avoid all liability for its temporary actions. Similarly, no court has ever found that legislative enactments like the National Environmental Policy Act ("NEPA") can shield the government from liability for violating constitutionally-protected rights. The government offers that procedural laws like NEPA will "tend" to discourage it from abusing the constitutional authority created here. *See* Opp. 18. But those laws do not constrain the ultimate, substantive decision, they do not compensate for injuries from government

invasions, and they did not prevent the destruction of the Commission's property here.[2]

As Judge Newman put it, the Federal Circuit's permanency rule "contradicts the entire body of precedent relating to the application of the Fifth Amendment to government-induced flooding." *See* App. at 37a (Newman, J., dissenting). That rule was outcome-determinative here and now applies to every flood control project that the federal government operates throughout the United States; if a landowner seeks more than $10,000 in just compensation, it must go through the Court of Federal Claims and the Federal Circuit. *See* Pet. 12 & n.1 (citing 28 U.S.C. §§ 1295(a)(3), 1346(a)(2), 1491(a)(1), (c)). That the Federal Circuit would conceive such an unfair rule that so upsets ordinary expectations, departs from precedent, and expands the government's authority to invade without paying just compensation shows how much this Court needs to clarify that temporary flood invasions can take property.

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[2] Ironically, the Corps had been testing its proposed revised water control plan for some time throughout the late 1990s up until 2001 while it actively engaged in the NEPA decision-making process. It was only after the Commission, joined by the U.S Fish and Wildlife Service and others, adamantly complained about the recurring deviations and the findings contained in the Draft Environmental Assessment and Finding of No Significant Impact that the Corps finally acknowledged its deviations were "negatively impacting [the Management Area] during [the] growing season" and ceased efforts to make the deviations permanent. App. 49a-52a, 55a-56a.

CONCLUSION

The Court should grant the petition.

Respectfully submitted,

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AMICUS CURIAE BRIEF

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INTEREST OF THE *AMICI CURIAE*[1]

The facts of this case are straightforward. The Arkansas Game & Fish Commission ("Commission") owns approximately 23,000 acres of land along the Black River in northeastern Arkansas that it manages as the Dave Donaldson Black River Wildlife Management Area ("Management Area"). The forests in the Management Area are comprised of different hardwood timber species, with the dominant species being nuttall, overcup, and willow oaks.

In 1948 in southeastern Missouri, upstream from the Management Area, the Army Corps of Engineers ("Corps") constructed the Clearwater Lake and Dam after the passage of the Flood Control Act of 1938, Pub. L. No. 75-761, 52 Stat. 1215, 1218. After construction of the dam was complete, the Corps immediately began to control releases of water from Clearwater Lake via the dam, and the timing and sizing of these water releases were published by the Corps in 1953 in the Clearwater Lake Water Control Manual ("Water Control Plan"). During the next forty (40) years the Corps followed its Water Control Plan, and the Commission's Management Area flourished. But from 1993 to 2000 the Corps implemented a series of consecutive, annually-approved deviations from its established Water Control Plan. The Court of

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[1] In accordance with Rule 37.2 the State of Arkansas provided notice to all counsel of record for all parties on November 29, 2011, which is more than 10 days before filing.

Federal Claims found that the effects of these deviations resulted in the destruction of more than five million dollars ($5,000,000) of timber in the Management Area, and that the Corp's actions constituted a taking in violation of the Fifth Amendment. *Arkansas Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 623 (2009). A split panel of the Federal Court of Appeals reversed. According to the majority panel, no taking had occurred because the Corps, after finally confirming the destruction complained of by the Commission for almost a decade, ceased its deviations from its Water Control Plan. Relying on flooding cases that analyzed and discussed flowage easements, the majority panel ruled that government-induced flooding that is not permanent falls within the category of torts and cannot, as a matter of law, be a taking. *See* App. 21a-22a.

Amicus State of Arkansas wants the Court to be cognizant of the fact that, pursuant to Amendment 35 of the Arkansas Constitution, the Commission is an independent constitutional agency. The Commission receives no revenue from the Arkansas General Assembly general revenue fund, and litigated this matter without input, or support, from the Arkansas Attorney General's office or any other Arkansas state agency. Amicus curiae the State of Arkansas files this brief, along with the other named amici curiae states, because they believe that the Federal Court's decision in this case has created a new exception in takings jurisprudence that warrants this Court's review.

William Blackstone famously proclaimed, "nothing strikes . . . the imagination, and affects and engages the affections of mankind, as the right of property." William Blackstone, *Commentaries on the Laws of England 2* (Univ. of Chi. Press 1979 (1766)). Besides the Fifth Amendment mandate that prohibits the federal government from taking private property without just compensation, basic fairness demands that the government compensate owners whose property it takes. This Court pronounced this fairness-based justification for the Fifth Amendment's compensation requirement in *Armstrong v. United States*, 364 U.S. 40 (1960), when it wrote:

> The Fifth Amendment's guarantee that private property shall not be taken for public use without just compensation was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole. *Id.* at 49.

This fairness aspect is particularly acute in this case because the Corps is immune from tort liability for federal flood control projects under the Flood Control Act of 1928, 33 U.S.C. §702c. The Court of Appeals decision, if not reviewed and overturned by this Court, will leave the Commission and other future parties without redress when the government engages in future temporary flooding regimes that result in damage to property. For this reason, amici states urge this Court to grant certiorari.

INTRODUCTION AND SUMMARY OF ARGUMENT

1. The Fifth Amendment to the Constitution of the United States provides, in part: " * * * nor shall private property be taken for public use, without just compensation." Over the years this Court has parsed takings into two general categories. The first is when government action results in a physical appropriation or destruction of property. In these cases, this Court has generally held that a taking has occurred. The second category recognizes that while the government may find it otherwise necessary to regulate the use of property from time to time, and while such regulatory activity does not typically result in a taking, in some instances the regulatory interference with the use of the property is so pervasive that it amounts to a taking. While the concept of what constitutes a "regulatory taking" continues to evolve, amici states argue that a situation in which the government's conduct results in a direct physical appropriation or destruction of property meets the standard and has, for decades, been recognized as a taking. In short, physical appropriation or destruction of property due to continuing government conduct over a period of years is a taking. Indeed, for the first 130 years of the Republic, there was not much doubt that the Constitution's takings clause applied to direct takings of property. *Mulger v. Kansas*, 123 U.S. 623 (1887). Nevertheless, a majority panel in *Arkansas Game & Fish Comm'n v. United States*, 637 F.3d 1366 (Fed. Cir. 2011) has misapplied this Court's takings cases

and has carved out an exception to the longstanding principle that destruction of property caused by deliberate government action constitutes a taking. According to the majority panel, the Corps' induced flooding in the Commission's Dave Donaldson Black River Management Area that lasted from 1993 to 2000, and resulted in the destruction of nearly 18 million board feet of timber across portions of the roughly 23,000 acre Management Area, does not constitute a taking because the Corps eventually ceased its destructive flooding eight (8) years after it began. Under the logic espoused by the Federal Appeals Court, destruction of private property due to prolonged, deliberate, authorized government action is not a taking when the government policies that resulted in the destructive flooding are "temporary," rather than "permanent." Creating a per se rule exempting "temporary" government flooding from a Fifth Amendment Taking conflicts with a number of decisions by this Court and other federal court cases, starting with *Pumpelly v. Green Bay Co.*, 80 U.S. 166 (1871). For this reason, the State of Arkansas urges this Court to grant certiorari.

2. In addition to misapplying this Court's takings decisions to the undisputed facts in this case, the majority panel of the Federal Court of Appeals also failed to follow two of its own cases on point. Contrary to the majority panel's decision in *Arkansas Game & Fish Comm'n v. United States*, 637 F.3d 1366 (Fed. Cir. 2011), other cases have held that "temporary" government action that causes flooding resulting in

the destruction of property can constitute a taking. *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003); *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987). The Federal Circuit's failure to follow this precedent warrants this Court's review.

3. According to the majority panel's decision, the Corps' actions in this case "at most created a tort liability." *Arkansas Game & Fish Comm'n v. United States*, 637 F.3d 1366, 1378-79 (Fed. Cir. 2011). In the future, other parties faced with similar "non-permanent" appropriations or destruction of private property due to flood waters will be left without an avenue to seek redress for the government's actions. The Flood Control Act of 1928, 33 U.S.C. §702c provides that "[n]o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place." Congress' grant of immunity bars the very remedy the Federal Circuit has held is applicable under these facts. Amici states believe that this result, and the future negative impact it may have on areas throughout the nation that abut federal control projects along navigable waterways, warrants this Court's grant of certiorari.

ARGUMENT

I. The Federal Circuit's Decision Conflicts With Takings Decisions From This Court And Other Federal Courts That Recognize Temporary Takings

The original understanding of the Constitution's takings clause was that it applied only to physical appropriations of property. However, in the case *Pumpelly v. Green Bay*, 80 U.S. 166 (1871), this Court made a substantial inroad into that notion. The *Pumpelly* case was brought by a landowner against his downstream neighbor who had built his dam under a license granted by the state, and the defendant asserted that he therefore had a "right, under legislative authority, to build and continue the dam without legal responsibility for those injuries." *Id.* at 176. The question thus became whether the "State had a right to inflict [the damages sustained by the plaintiff] without making any compensation for them." *Id.* The takings clause was asserted as the basis for concluding the state did not have such a right. *Id.*

The thrust of the defendant's argument was that "there is no taking of the land within the meaning of the constitutional provision, and that the damage was a mere consequential result of legitimate governmental action, fostering the improvement of a navigable stream." *Id.* at 177. The defendant claimed that the case was not a true "taking" in the Constitutional sense, because the defendant's lands had not been taken or appropriated, but merely affected. In other

words, the plaintiff still had his land; it was just under water.

This Court disagreed with the defendant's position concerning the inapplicability of the takings clause to the damage at issue. This Court held that:

> [W]here real estate is actually invaded by superinduced additions of water, earth, sand, or other material, or by having any artificial structure placed on it, so as to effectually destroy or impair its usefulness, it is a taking, within the meaning of the Constitution. . . ." *Id.* at 181.

Relying on the reasoning announced in *Pumpelly*, this Court and other courts continued to develop Fifth Amendment Takings Law as it applied to instances of government flooding. *See, e.g.*, *United States v. Cress*, 243, U.S. 316, 328 (1917) (A taking occurred where the erection of a lock and dam subjected the plaintiff's land to frequent overflows of water); *United States v. Dickinson*, 331 U.S. 745, 751 (1947) (Finding a taking although the plaintiff reclaimed most of the land that the government flooded).

In this case, the Federal Circuit erred because it limited takings claims to instances when the government's flood intrusions into property are permanent, rather than temporary. But this Court's precedents do not require permanent government action as a condition precedent in order for a taking to occur. In *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982), this Court cited a series of

flooding cases to underscore its conclusion that, while the analysis of whether a specific physical government intrusion constitutes a taking requires the application of a complex balancing test, the fact that the intrusion is temporary does not, by itself, exempt the intrusion from that analysis and a taking claim. *See also United States v. Dickinson*, 331 U.S. 745, 751 (1947); *cf. San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 657-58 (1981) ("Nothing in the Just Compensation Clause suggests that 'takings' must be permanent and irrevocable."); *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304 (1987) (holding that the government must pay just compensation even if it rescinds a regulatory taking); *Hendler v. United States*, 952 F.2d 1364, 1376 (Fed. Cir. 1991) ("All takings are 'temporary' in the sense that the government can always change its mind at another time.").

Pursuant to the logic espoused by the Federal Circuit in this case, the Corps could have engaged in twenty-five (25), fifty (50) or even one-hundred (100) year-to-year deviations from its Water Management Plan without being held liable for a taking, so long as those deviations were not a "permanent" policy decision. To claim that government flooding is not compensable under the Fifth Amendment based solely on whether the government's policy decisions to initiate the flooding are temporary or permanent is woefully inadequate for fulfilling the purpose behind the Takings Clause. That clause requires just compensation to "bar Government from forcing some people

alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960).

The Federal Circuit grudgingly acknowledged that this Court's decisions indeed hold that temporary government action "[i]n general" can lead to a taking. *See* App. 18a. But it erred when it distinguished the law of temporary takings from flooding cases. Contrary to the Federal Circuit's decision, instances of repeated, methodical, and planned government flooding that eventually cease do not occupy a special niche in takings jurisprudence. Admittedly, some government actions that have resulted in short duration floods have been held not to constitute a taking. *See, e.g., Hartwig v. United States*, 485 F.2d 615, 620 (Ct. Cl. 1973) ("The principle may be reduced to the simple expression: "One flooding does not constitute a taking."). Also, when a government induced flooding does not produce extensive or permanent damage, a taking does not occur, even if the flooding is long-standing and continuous. *Sanguinetti v. United States*, 264 U.S. 146, 149-50 (1924). ("If there was any permanent impairment of value, the extent of it does not appear"). But the analysis underpinning the *Hartwig* and *Sanguinetti* decisions does not apply in this case because in this case it was undisputed at trial that the Corps' actions that resulted in the destruction of timber in the Commission's Management Area were not a "one time" event – in this case the Corps flood control policy lasted eight years. Moreover the resulting

damage from the Corps' eight-year flood control policy was not inconsequential. It amounted to more than five million dollars ($5,000,000) worth of timber and more than one hundred seventy-five thousand dollars ($175,000) in incurred repair costs. The Federal Circuit's decision is in error because it conflicts with the Takings Clause and this Court's decisions that temporary government actions can result in Fifth Amendment Takings. Amici states petition the Court to grant review and then reverse and remand this matter to the Federal Circuit.

II. The Federal Circuit Erred By Not Following The *Ridge Line* And *Cooper* Cases

Previous to the Federal Circuit's decision in this case, no court has ever held that timber damage due to flooding is never compensable if the government's decisions that created the flooding and damage are eventually stopped after eight consecutive years. Indeed, two Federal Circuit decisions, *Ridge Line, Inc. v. United States*, 346 F.3d 1346 (Fed. Cir. 2003) and *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987) hold just the opposite.

The *Ridge Line* case involved the construction of a postal facility. The paved areas of the new facility altered the natural stormwater runoff, causing flooding and damage to the Ridge Line shopping center. Ridge Line eventually implemented its own measures to control and stop stormwater runoff from the postal facility from damaging its property.

Nevertheless, Ridge Line filed suit against the government alleging a temporary taking of its property. The Claims Court denied the relief sought by Ridge Line ruling that the flooding was not permanent, and therefore not compensable as a Fifth Amendment Taking. Ironically, the Federal Circuit reversed and remanded, noting that the Claims Court had erred because it had confined its "analysis of liability to whether the government's actions constituted a permanent and exclusive occupation." 346 F.3d at 1352. The Federal Circuit went on to explain that "intermittent flooding of private land can constitute a taking" and that continuous inundation was not required. *Id.* at 1357.

But if there were any doubt about whether the government was exempt from a temporary takings claim due to deliberate flooding of property over a period of years, it was answered by the Federal Circuit's decision in *Cooper*. On facts virtually identical to those in this case, the Federal Circuit addressed a 1979 construction blockage that imposed seasonal flooding while the Corps of Engineers tried to clear it. 827 F.2d at 763-64. The flood water subjected Cooper's timbered land to standing flood water for prolonged periods during the spring and summer growing seasons. The Corps succeeded in clearing the blockage in 1984, but five years of intermittent flooding had, by then, killed the plaintiff's timber. Even though the flooding was stopped by the Corps five years after it commenced, the Federal Circuit held that the Corps' temporary flooding constituted a

taking, and awarded Cooper the value of the destroyed timber. *Id.* at 763-64.

In this case the Federal Circuit majority attempted to distinguish its own *Cooper* decision by reasoning that *Cooper* "did not discuss the tort versus taking distinction." *See* App. 26a-27a, FN.7. Under the facts of this case, that argument is a distinction without a difference. As in *Cooper*, the Corps in this case flooded property over a period of years. Like *Cooper*, that flooding took place during the critical spring and summer growing seasons. And like *Cooper*, the Corps' temporary flooding regime resulted in the destruction of acres of timber. In short, there is no real distinction between the facts in *Cooper* and the facts in this case. The only distinction between this case and *Cooper* is the result. In *Cooper* the Federal Circuit found that a compensable taking had occurred; in this case the Federal Circuit held that, at most, a tort had occurred. The Federal Circuit's ignoring its own taking decisions handed down in *Ridge Line* and *Cooper* demonstrates how much this Court's review is required.

III. The Federal Circuit's Decision Has Serious Repercussions For Areas That Abut This Nation's Navigable Waters

Every year millions of sportspersons engage in wildlife-associated activities such as fishing, hunting and birding. According to a survey conducted by the U.S. Fish and Wildlife Service, sportspersons spent a

total of $76.7 billion on items used for hunting and fishing in 2006. U.S. Fish and Wildlife Service, *2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation*. Among the most zealous of these sportspersons are those who pursue ducks and geese along the flyways that abut the nation's navigable streams and rivers. Waterfowl hunters spend money on a variety of goods and services for trip-related and equipment related purchases. Trip-related expenditures include food, lodging, transportation, and other incidental expenses. *Id.* Equipment related expenditures consist of guns, decoys, camping equipment, clothing, and other costs. These expenditures in turn have a ripple effect throughout the economy, having positive impacts on local retailers, wholesalers, manufacturers, employment, and household income. According to the U.S. Fish and Wildlife, waterfowl hunting in 2006 along the nation's flyways generated $2.3 billion in total output in the United States; created 27,618 jobs with $884 million in employment income; and $154 million in state tax revenue and $193 million in federal tax revenue. *Id.* Among the states, Arkansas, Louisiana, Mississippi, Missouri, Texas, and South Dakota are some of the largest beneficiaries of these ripple effects, and amici states are confident that these positive economic impacts have continued to rise since 2006. *Id.* The continued health of habitat, both public and private, that abuts federal flood control projects is a vital concern to the states.

But the economic benefits associated with these riparian lands are not limited to just hunting. Amici states, and the majority of other states in the nation, hold in trust public lands and state parks along navigable rivers that can be influenced by federal flood control projects. Similar to waterfowl hunters that spend time and money in the nation's flyways, the annual visitors to state parks also create a ripple effect throughout the economy, having positive impacts on local retailers, wholesalers, manufacturers, employment, and household income. Amici states are aware that the likelihood that the Corps would deliberately flood and damage a state park is remote. But the Federal Circuit's decision in this case is so broad that the Corps *can* "temporarily" flood all riparian property within the reach of any flood control project every year, fundamentally altering and damaging these ecosystems, without fear of liability. Consequently, amici states are alarmed about the continued viability of these areas, and the widespread economic tumult that would result if they are damaged.

The anxiety the amici states have is particularly acute as it relates to the Nation's Wildlife Management Areas that abut federal flood control projects. Wildlife Management Areas are an integral part of this nation's outdoor recreation system and have been established to protect those lands that have a high potential for wildlife production, and the attendant public hunting, trapping, fishing and other compatible recreational uses at little or no cost to the

participants. Taxpayers throughout the nation have funded the efforts to preserve and protect these critical properties. Wildlife Management Areas are the backbone of each state's wildlife management efforts, and areas that abut the country's navigable waters are among the most critical. These Wildlife Management areas provide hundreds of thousands of citizens in each amicus state, and millions of citizens across the country, access to prime, public resources so that they may hunt major game species such as waterfowl, deer, turkey, rabbit, and squirrel. Even citizens who are not hunters can enjoy the splendor of hiking and wildlife watching that abounds in these natural areas. These lands are the cornerstone of each state's wildlife management, and the majority of a wildlife manager's work is dedicated toward protecting and enhancing wildlife habitat in Wildlife Management Areas. Forest openings are maintained to benefit waterfowl, turkey, and deer. Wildlife food plots are managed to feed both resident and migratory species. Shelter belts are planted to provide winter cover and nesting sites for birds and other nongame species. Yet, despite the success each state has had in enhancing its Wildlife Management Areas, the nation is still losing wildlife habitat at an alarming rate. Amici states believe that the trend of loss of wildlife habitat may accelerate if the Federal Circuit's decision in this case is not reviewed and overturned by this Court.

The Federal Circuit decision has effectively carved out a category of physical invasions from the

Takings Clause. The Federal Circuit has declared, as a matter of law, that the Takings Clause does not provide compensation when temporary government actions cause destructive flooding. The Fifth Amendment is grounded in basic fairness, and fairness is the reason for requiring that the government compensate owners whose property it takes. *Armstrong v. United States*, 364 U.S. 40 (1960).

The Federal Circuit's Takings Clause exemption for temporary flood waters, coupled with the immunity provided by Congress to the government under the Flood Control Act of 1928, 33 U.S.C. §702c, leaves amici states and the rest of the states in an untenable situation regarding the management of their riparian property that abuts federal flood control projects along the nation's navigable rivers. The Federal Circuit's prophylactic Takings Clause exception for temporary flood waters means that the government may temporarily and repeatedly manipulate flooding regimes creating substantial, foreseeable damage to state property near federal flood control projects without incurring any liability. In turn, this affects how each state will addresses state park and wildlife management of these areas in the future. In this instance, there is no dispute that thousands of acres of timber have been destroyed by the Corps in the Dave Donaldson Wildlife Management Area, and that this property is in need of restoration. Restorations requires resources, resources are scarce, and there is no incentive to spend valuable taxpayer dollars managing and restoring these critical areas if the

Corps can engage in ad hoc, year-to-year policy decisions that can destroy them again in the future. (Although the Corps has now refrained from the Water Plan diversions which caused destructive flooding in Arkansas' Dave Donaldson Wildlife Management Area, nothing prevents the Corps from resuming those destructive diversions at its sole discretion.) The Federal Circuit's decision exempting temporary flood waters from takings claims falls woefully short of the fairness required by the Constitution's Takings Clause. Amici states of Arkansas, Louisiana, Mississippi and South Dakota urge this Court to grant certiorari.

CONCLUSION

Based upon the above stated arguments, the amici states respectfully request that the Court grant the Petition for Writ of Certiorari.

Respectfully submitted,

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AMICUS CURIAE BRIEF

RECORD AND BRIEFS

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In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF *AMICUS CURIAE* ASSOCIATION OF FISH & WILDLIFE AGENCIES SUPPORTING PETITIONER

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INTEREST OF THE *AMICUS CURIAE*

For the past century, North America's state, provincial, and territorial fish and wildlife agencies have upheld the primary responsibility for conserving and preventing the exploitation of North America's wildlife resources on public and private lands within their borders. The Association of Fish & Wildlife Agencies ("AFWA")[1] represents these agency members in Washington, DC to advance sound, science-based management and conservation policy for fish and wildlife and their habitats and also works to strengthen state, federal, and private cooperation in conserving America's natural resources in the public interest.

Founded in 1902 under a different name, AFWA originally formed to establish a system of mutually beneficial interstate cooperation in game and fish management. Its work over the past century has spanned from involvement with the passage of the Migratory Bird Treaty Act in 1918 to creating a model of state fish and wildlife agencies in 1934 to advocacy in 2010 for dedicated funding in climate change legislation for natural resource adaptation. AFWA has also participated as *amicus curiae* in the nation's courts, including before this Court, to safeguard the rights and interests of its members.

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[1] Counsel of record for all parties received notice at least 10 days before the due date of the amicus curiae's intention to file this brief. Letters of consent from all parties accompany this brief. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief.

The bulk of AFWA's agency members maintain Wildlife Management Areas ("WMAs") similar in nature to the WMA managed by the Arkansas Game & Fish Commission ("AGFC") in this case, and many of the WMAs are downstream from and affected by dams with controlled flooding. Indeed, many of AFWA's agency members themselves manage dams with controlled floods that affect downstream acreage owned by others. The Court should grant certiorari to clarify whether temporary physical occupations, including occupations by flooding, can constitute a taking. A ruling from this Court would provide needed clarity to fish and wildlife agencies on current law under the Takings Clause, both as to their rights for their property affected by temporary flooding and as to their obligations for their own flood management. To be clear, AFWA does not support or oppose the position of any particular party to this case. Rather, AFWA merely seeks clarity on behalf of its member agencies on this critical legal issue. Only this Court can provide that clarity, which appears to have been brought into question by the Federal Circuit's opinion in this case.

SUMMARY OF THE ARGUMENT

With good reason, much of the development of takings law in recent decades has pertained to regulatory takings rather than those involving physical appropriation of property. The focus on regulatory takings, however, has seemingly left a gap in the law regarding temporary physical takings. The Federal Circuit's decision in this case has accentuated this uncertainty, particularly for takings caused by intermittent flooding. The Federal Circuit has created a *per se*, categorical rule that a flood cannot effect a taking unless the flood is permanent or inevitably

recurring. This result appears to conflict with this Court's previous rulings on temporary takings and with this Court's and the Federal Circuit's previous analysis of takings involving temporary flooding.

This conflict in the law creates serious difficulty for those, like AFWA's member agencies, who manage land, including wildlife and habitat, downstream from water control structures and for those, including both AFWA's member agencies and the United States Army Corps of Engineers ("Corps of Engineers), who manage those dams and water control structures. This issue deeply affects the management of hundreds of dams and millions of acres of land throughout the United States. Only this Court can provide the legal clarity that the affected parties need to manage effectively the dams, land, wildlife, and habitat in their charge.

ARGUMENT

I. THE FEDERAL CIRCUIT'S DECISION HAS CREATED UNCERTAINTY IN THE LAW REGARDING TEMPORARY TAKINGS, PARTICULARLY THOSE INVOLVING INTERMITTENT FLOODING.

AFWA does not wish to burden the Court by restating arguments set forth in other briefs supporting the petition for a writ of certiorari in this case. AFWA will succinctly note, nevertheless, that the Federal Circuit's decision below creates apparent conflict in applicable case law, thereby creating lack of clarity for AFWA, its agency members, and others.

This Court has previously determined that temporary takings, whether through regulation or

physical occupation of premises, that deny an owner use of its property "are not different in kind from permanent takings, for which the Constitution clearly requires just compensation." *First English Evangelical Lutheran Church of Glendale v. Cnty. of Los Angeles*, 482 U.S. 304, 318 (1987). In *First English Evangelical Lutheran Church*, the Court recounted and found substantial guidance from three cases decided during World War II, all of which involved appropriation of private property by the United States through physical occupation of premises. *Id.* (relying on *Kimball Laundry Co. v. United States*, 338 U.S. 1 (1949); *United States v. Petty Motor Co.*, 327 U.S. 372 (1946); *United States v. General Motors Corp.*, 323 U.S. 373 (1945)). "Though the takings [in those cases] were in fact 'temporary,' there was no question that compensation would be required for the Government's interference with the use of the property[.]" *Id.* (citation omitted). *First English Evangelical Lutheran Church* itself dealt not with physical occupation of property by the government but rather restriction of use through a county ordinance. *See generally id.* Ultimately, the Court ruled that "the Fifth Amendment requires that the government pay the landowner for the value of the use of the land during" the period of the taking regardless whether the ordinance or regulation at issue is later amended or invalidated. *Id.* at 319.

This Court later more explicitly affirmed the possibility of temporary regulatory takings in *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*. 535 U.S. 302 (2002). In that case, the Court held that whether the Takings Clause requires compensation when the government enacts a temporary regulation should be decided not by any

categorical rule but rather by applying the factors of *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104 (1978). *Id.* at 342; *see also generally id.* The Court specifically declined to "hold that the temporary nature of a land-use restriction precludes finding that it effects a taking" and rather concluded that the temporary nature of the restriction "should not be given exclusive significance one way or the other." *Id.* at 337. The Court further emphasized that the "'temptation to adopt what amount to *per se* rules in either direction must be resisted.'" *Id.* (quoting *Palazzolo v Rhode Island*, 533 U.S. 606, 636 (2001) (O'Connor, J., concurring)).

Yet, it appears that the Federal Circuit in this case has adopted a *per se*, categorical rule in the context of intermittent flooding: "flooding must be a permanent or inevitably recurring condition, rather than an inherently temporary situation, to constitute the taking of a flowage easement. Because the deviations from the 1953 plan were only temporary, they cannot constitute a taking." App. 26a-27a. On its face, this ruling creates an inherent conflict with this Court's holdings on temporary takings as discussed briefly above.

Admittedly, the temporary regulatory takings at issue in *First English Evangelical Lutheran Church* and *Tahoe-Sierra Preservation Council* differ in character than the physical invasion of property that a flood represents. The Court has naturally treated regulatory takings differently than it has treated physical appropriations, and the law governing each fact pattern often has little effect on the other. *See, e.g.*, *Tahoe-Sierra Preservation Council*, 535 U.S. at 323-24. Perhaps this Court has addressed temporary

regulatory takings more in recent years than temporary physical appropriations simply because "physical appropriations are relatively rare [and] easily identified." *Id.* at 324. Regardless, it would seem curious that the Takings Clause would require that just compensation be paid to landowners whose property has been affected by a temporary regulation and not to landowners whose property has been physically appropriated when the Court has also ruled that physical appropriations "usually represent a greater affront to individual property rights" than do regulatory restrictions. *Id.*; *cf. Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 433 (1982) (noting that physical appropriations of property are "unusually serious" compared to regulatory restrictions).

While cases involving flooding, or "flowage easements," would seem to fall under the physical-appropriation umbrella of takings law, the Federal Circuit appears to have created a separate rule for the evaluation of flooding cases. Even in that instance, however, the Federal Circuit ruling does not appear to square with dicta in this Court's opinion in *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982). There, the Court cited flooding cases to demonstrate that a permanent physical occupation would always constitute a taking. *Id.* at 482. In a footnote, it also noted that temporary limitations in intermittent flooding cases "are subject to a more complex balancing process to determine whether they are a taking." *Id.* at 436 n.12.

Further, the Federal Circuit's ruling in this case appears inconsistent with its previous ruling in *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987). There,

as the United States Court of Federal Claims found here, flooding caused by the Corps of Engineers over a period of years killed timber on the plaintiff's land. The court in *Cooper* determined that a taking had occurred even though the Corps of Engineers stopped the flooding after a period of five years. 827 F.2d at 763-64. Though the court did not use this particular language, the flooding in *Cooper* was not permanent or inevitably recurring. *See generally id.*

Although the constitutional underpinnings for such a distinction seem unclear, perhaps flooding or flowage easement takings should occupy their own category in takings law. Again, AFWA takes no position with regard to the merits of the AGFC's claim or the Federal Circuit's decision. That decision, however, seems only to have muddied the law, both as to the rights of the landowners whose property has been flooded and as to the obligations of those managing dam systems in the United States. On behalf of its agency members, AFWA seeks clarity on these points, which only this Court can provide.

II. A GRANT OF CERTIORARI AND RULING BY THIS COURT WOULD PROVIDE CLARITY IN THE LAW THAT HAS SUBSTANTIAL, FAR-REACHING IMPACT.

The temporary, physical occupation of private property by the government represents a fact pattern that could of course present itself in countless hypothetical situations. The clarity provided by a Supreme Court ruling on temporary physical takings would be of critical importance to the resolution of these cases in the future, particularly given the lack of recent discussion on that front. Regardless of the

particular circumstances of those hypothetical situations, a Court ruling in this case on the issue of whether a flood that is not permanent or inevitably recurring can effect a taking would have immediate impact on the management of millions of acres of land in the United States and on the wildlife inhabiting that land. More specifically, such a decision would strongly affect how territorial fish and wildlife agencies manage and protect the public land in their charge and would shape how they, the Corps of Engineers, and others, manage the dam systems that largely determine the flooding of those lands.

To demonstrate the potential impact of this decision and exhibit the amount of land and water control structures at issue, several territorial fish and wildlife agencies have identified property under their jurisdiction that would be affected by the Court's decision in this case. For example, in Louisiana, the Department of Wildlife & Fisheries has identified the following WMAs that could be impacted by a dam or water control structure: Alexander State Forest (283 acres), Atchafalaya Delta (137,695 acres), Attakapas (25,730 acres), Bayou Macon (6,919 acres), Bayou Pierre (2,212 acres), Big Colewa Bayou (899 acres), Big Lake (19,231 acres), Boeuf (50,967 acres), Dewey Wills (63,401 acres), Elbow Slough (160 acres), Elm Hall (2,839 acres), Grassy Lake (12,983 acres), Joyce (26,152 acres), Little River (3,911 acres) Manchac (8,328 acres), Maurepas (103,000 acres), Ouachita (10,989 acres), Pass-a-Loutre (115,596 acres), Pearl River (35,031 acres), Pomme de Terre (6,434 acres), Red River (29,964 acres), Russell Sage (16,559 acres), Sabine Island (8,695 acres), Salvador (33,047 acres), Sherburne (11,780 acres), Spring Bayou (12,506 acres), and Three Rivers (26,204 acres). The bulk of this

acreage (479,591 acres) is bottomland hardwood forest and cypress swamp.

In South Carolina, the Department of Natural Resources has identified three impoundments managed by the Corps of Engineers that are upstream from four separate WMAs. The impoundments include Hartwell Dam and Lake, Richard B. Russell Lake & Dam, and J. Strom Thurmond Lake & Dam. The WMAs, all located along the Savannah River, include the Mason Tract WMA, with 1.2 miles of river frontage, the Hamilton Ridge WMA, with an estimated floodplain of between 5,000 and 6,000 acres, the James W. Webb WMA, with an estimated floodplain of 3,000 acres, and the Palachucola WMA, with an estimated floodplain of 2,000 acres.

On the other side of the coin, The Pennsylvania Game Commission owns over 300 dams, 50 of which are permitted and 7 of which are considered high hazard. In Rhode Island, there is one federally-owned dam, and the State has determined that that dam presents a significant risk of flooding downstream. The State of Rhode Island owns 77 dams, 17 of which present a significant risk of flooding downstream. In Tennessee, the Wildlife Resources Agency has identified 18 lakes in western and middle Tennessee, all of which have some sort of dam, and nearly of which are managed by the Agency. In Arizona, the Game and Fish Department manages 37 dams, seven of which fall into a high hazard classification and three of which fall into a significant hazard classification.

Arkansas provides an example of at least one state that manages both dams with water control structures and also manages land and wildlife downstream from

these dams and those operated by others, primarily the Corps of Engineers. Specifically, the AGFC identified 46 dams with water control structures that it operates. Further, the AGFC identified the following WMAs that could be impacted by a dam or water control structure: Henry Gray Hurricane Lake (17,524 acres), Mike Freeze Wattensaw (19,184 acres), Bayou Meto (33,832 acres), Sulphur River (16,520 acres), Little River (597 acres), Beryl Anthony Lower Ouachita (7,020 acres), Trusten Holder (8,173 acres), Petit Jean (15,502 acres), Harris Brake (2,700 acres), and Galla Creek (3,329 acres).

These represent but a few examples of the millions of acres of land, including the wildlife and habitat of those lands, across the United States that are impacted by decisions regarding flood management. Again, those flood-management decisions would largely be shaped by the Supreme Court's decision should it grant certiorari and rule on this case. The incredible amount of land at issue is amplified when considering that the WMA affected in this case, the Dave Donaldson Black River WMA, is located 115 miles downstream from the Clearwater Dam. It would entail speculation, but the amount of land and number of landowners, public or private, affected by this single dam is staggering to contemplate. The numbers grow monumentally from there when considering the number of dams affected across the country as a whole. At the least, this particular fact pattern and the law governing it profoundly impact the territorial fish and wildlife agencies throughout the United States, both as to their management of public land, including the wildlife and habitat on the land, and in their management of dam systems affecting downstream lands. The Court should grant certiorari to provide the

clarity that these entities need to carry out effectively the important task that is their charge.

CONCLUSION

For these reasons, the petition for a writ of certiorari should be granted.

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December 16, 2011.

AMICUS CURIAE BRIEF

No. 11-597

IN THE
SUPREME COURT OF THE UNITED STATES

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF *AMICI CURIAE* NATIONAL ASSOCIATION OF HOME BUILDERS AND THE AMERICAN FOREST RESOURCE COUNCIL SUPPORTING PETITIONER

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INTEREST OF THE *AMICI CURIAE*

NAHB[1] is a Washington, D.C.-based trade association whose mission is to enhance the climate for housing and the building industry. Chief among NAHB's goals is providing and expanding opportunities for all people to have safe, decent and affordable housing. As the voice of America's housing industry, NAHB helps promote policies that will keep housing a national priority.

Founded in 1942, NAHB is a federation of more than 800 state and local associations. About one-third of NAHB's 160,000 members are home builders and/or remodelers, and its builder members construct about 80 percent of the new homes built each year in the United States. The remaining members are associates working in closely related fields within the housing industry, such as mortgage finance and building products and services.

NAHB is a vigilant advocate in the nation's courts. It frequently participates as a party litigant and *amicus curiae* to safeguard the property rights and interests of its members. NAHB was a petitioner in *NAHB v. Defenders of Wildlife*, 551 U.S.

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1 Counsel of record for all parties received notice at least 10 days prior to the due date of the amicus curiae's intention to file this brief. The parties have given consent and the letters of consent to file this brief are attached. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amici curiae*, its members, or its counsel made a monetary contribution to its preparation or submission.

644 (2007). It also has participated before this Court as *amicus curiae* or "of counsel" in a number of cases involving landowners aggrieved by excessive regulation under a wide array of statutes and regulatory programs. *See* Appendix A.

NAHB's organizational policies have long advocated that property owners must be able to bring inverse condemnation claims in response to government invasions of their property. As property owners, NAHB members often confront the physical impacts to their land of federal and state government action.

American Forest Resource Council (AFRC) is an Oregon nonprofit corporation that represents the forest products industry throughout Oregon, Washington, Idaho, Montana, and California. AFRC represents over 50 forest product businesses and forest landowners. AFRC's mission is to create a favorable operating climate for the forest products industry, ensure a reliable timber supply from public and private lands, and promote sustainable management of forests by improving federal laws, regulations, and policies regarding management of forest lands. AFRC members have a great interest that their forest lands not be taken without just compensation and have asserted their property rights in takings cases involving government regulation of forest lands for spotted owls.

The Court should grant certiorari to clarify that temporary physical occupations, including flooding, can result in a compensable taking. Correcting the

Federal Circuit's ruling with respect to temporary flooding will eliminate the current confusion over temporary physical occupations and just compensation requirements under the Takings Clause.

SUMMARY OF ARGUMENT

This matter presents an excellent opportunity to clarify federal takings law as it relates to temporary physical takings. A wide variety of courts have required just compensation where temporary physical occupations severely impact a property owner's land. The Court, however, has not yet articulated a clear test or explained how the permanent physical takings test in *Loretto v. Teleprompter Manhattan CATV Corp. et al.*, 458 U.S. 419 (1982) is to be applied to temporary physical occupations.

Precedent from both the Court and lower courts strongly suggests that the severity and duration of the occupation should be weighed to determine whether a temporary physical occupation results in a taking. Thus, "[the] imposition should be subject to the 'more complex balancing process' that *Loretto* explained should be applied to temporary physical takings. That process would consider . . . the degree of the imposition and its duration." Daniel L. Siegel & Robert Meltz, *Temporary Takings: Settled Principles and Unresolved Questions*, 11 Vt. J. Envtl. L. 479, 508 (Spring 2010).

By creating a *per se* rule that temporary flooding can only result in a taking when it is inevitably recurring, the Federal Circuit's decision runs directly counter to this precedent and eviscerates long-held physical takings principles.

ARGUMENT

I. THE COURT SHOULD CLARIFY THE CIRCUMSTANCES UNDER WHICH A TEMPORARY TAKING CAN OCCUR

While much ink has been spilled regarding the complexities of regulatory takings, physical takings analysis has not received the same attention from the Court. Many courts and commentators appear content to limit the physical takings analysis to the Court's decision in *Loretto*, 458 U.S. 419 (1982). Namely, that "where government requires an owner to suffer a permanent physical invasion of her property—however minor—it must provide just compensation." *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 538 (2005).

As the decision below shows, however, courts have struggled with the application of this rule where an occupation is temporary but causes permanent damage to property. For this reason, courts have been left to apply *ad hoc* tests, resulting in inconsistent decisions.[2] This case presents the perfect opportunity to clarify past decisions and explain how *Loretto*, and related decisions, are to be applied to temporary takings.

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[2] *Compare McKay v. United States*, 199 F.3d 1376 (Fed. Cir. 1999) (installation of ground water monitoring wells for period of years is a physical taking) *with Ramsey Winch Inc. v. Henry*, 555 F.3d 1199 (10th Cir. 2009) (prohibiting property owner from excluding others does not create physical taking).

A. The Court Has Determined That a Temporary Physical Occupation Can Result in A Compensable Taking

Even prior to *Loretto*, the Court has determined that many temporary physical occupations are compensable takings under the Fifth Amendment. In fact, the Court determined that a taking occurred in a trilogy of cases involving the occupation of property by the federal government during World War II. *Kimball Laundry Co. v. United States*, 338 U.S. 1 (1949); *United States v. Petty Motor Co.*, 327 U.S. 372 (1946); *United States v. Gen. Motors Corp.*, 323 U.S. 373 (1945). In this line of cases, the Court found that the government must pay just compensation for takings that were temporary in duration, but total and complete in nature.

In *Kimball Laundry*, the military used and occupied property owner's laundry business. 338 U.S. at 5. The Court explained that "when the Government has taken the temporary use of such property, it would be unfair to deny compensation for a demonstrable loss of going-concern value upon the assumption that an even more remote possibility—the temporary transfer of going-concern value—might have been realized." *Id.* at 15. In *Gen. Motors Corp.* the Court went further, holding that "taken" within the Fifth Amendment includes not only substitution of ownership but deprivation of ownership including damage to, depreciation of, and destruction of property. 323 U.S. at 380.

Despite these early cases, when the Court next addressed the physical takings issue in *Loretto*, it

only addressed temporary physical encroachments in dicta. The Court first explained that temporary physical occupations are not *per se* takings. Using intermittent flooding cases as an example, the Court explained that "such temporary limitations are subject to a more complex balancing process to determine whether they are a taking." 458 U.S. at 436 n.12.

The Court's most recent explanation of temporary physical takings occurred in the context of a regulatory takings case. In *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles,* 482 U.S. 304 (1987), the Court expounded upon the existence of temporary physical takings as part of its analysis of temporary regulatory takings.

The Court first acknowledged that the World War II line of cases stood for the principle that compensation is required for the government's temporary interference with the use of property. *Id.* at 318. The majority explained that these physical occupation cases meant "that 'temporary' takings which . . . deny a landowner all use of his property, are not different in kind from permanent takings, for which the Constitution clearly requires compensation." *Id.*

In their dissent, Justices Stevens, Blackmun, and O'Connor took this analysis of temporary physical takings even further. They explained:

> "[I]f the government appropriates a leasehold interest and uses it for a public purpose, the return of the premises at the expiration of the lease would obviously not erase the fact of the government's temporary occupation. Or if the government destroys a chicken farm by building a road through it or flying planes over it, removing the road or terminating the flights would not palliate the physical damage that had already occurred. These examples are consistent with the rule that even minimal physical occupations constitute takings which give rise to a duty to compensate."

Id. at 329. Thus, the Court has clearly stated that temporary physical occupations can result in compensable Fifth Amendment takings. Unfortunately, these statements have largely been in the context of dicta and have not resulted in the formulation of a broadly applicable rule. A decisive holding here would help to define and narrow the still nascent temporary physical takings doctrine.

B. Both Physical Impact and the Length of Occupation Are Relevant to A Temporary Physical Takings Analysis

It would be incorrect to assert that all temporary physical occupations should be treated as *per se* takings. Opinions from both the Court and lower courts point to a middle ground based on the amount of damage caused by a physical occupation and its duration. The Federal Circuit's opinion below,

however, stands in stark contrast to this line of precedent by dismissing both the physical effects and duration of flooding on the Petitioner's land. This results in yet another *per se* rule to be applied to some, but not all, temporary flooding cases.[3]

Where the amount of damage or the nature of an occupation is substantial, courts should find that a temporary physical taking has occurred. Commentators have suggested that these cases stand for the principle that "where an imposition is temporary, it is considerably more likely to be seen as a taking if the occupation or appropriation is total as opposed to partial." 11 Vt. J. Envtl. L. 479 at 506 (2010).

The Federal Circuit employed this analysis in *McKay v. United States*, 199 F.3d 1376 (Fed. Cir. 1999). In that case, the court examined the extent of physical and monetary damage caused by government ground water monitoring wells placed on the property owner's land. The fact that the wells damaged the owner's mineral estate was an important element of the court's determination that a physical taking had occurred. *Id.* at 1381.

Yet the Federal Circuit refused to apply these principles in the context of severe, yet temporary

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[3] The Court has urged caution in the creation of *per se* rules in the context of the Takings Clause. *See Palazzolo v. Rhode Island et al.*, 533 U.S. 606, 636 (2001) ("The temptation to adopt what amount to *per se* rules in either direction must be resisted. The Takings Clause requires careful examination and weighing of all the relevant circumstances in this context.").

flooding. Relying instead on antiquated flowage easement cases, the court determined that only inevitably recurring flooding could result in a temporary physical taking. *Arkansas Game & Fish Comm'n*, 637 F.3d 1366, 1374 (Fed. Cir. 2011). This reasoning, however, ignores the very real physical and economic effects that most flooding has on property.

Thus, the intensity of the occupation is an important factor that should govern whether a physical taking has occurred. When the degree of intrusion is sufficiently intense, it will result in a taking. In other words, the intrusion "actively materially and substantially interferes with the plaintiff's use and enjoyment of his property." *Otay Mesa Property L.P. et al. v. United States*, 86 Fed. Cl. 774, 786 (Fed. Cl. 2009).

The length of a temporary occupation is closely tied to the intensity of the occupation. The Federal Circuit has explained that "permanent does not mean forever, or anything like it. The Government's physical occupation is permanent if the intrusion is a substantial physical occupancy of private property. The occupation need not be exclusive, or continuous and uninterrupted to constitute a taking." *Hendler v. United States*, 952 F.2d 1364, 1376 (Fed. Cir. 1991). Therefore, the intensity of an occupation must be balanced with the duration or frequency of an occupation in order to determine whether a temporary physical occupation results in a taking.

In other words, where an invasion is temporary but substantial in nature, it is distinguishable from cases like *Pruneyard Shopping Ctr. v. Robins*, 447 U.S. 74 (1980), where the physical impact was far less significant. Courts should weigh both factors in order to determine whether temporary flooding rises to the level of a physical taking:

> Flooding is a direct physical entry and use by the government . . . [T]he extent of impairment, like the duration of the intrusion, is not irrelevant. The greater the impairment, the more compensation required. If the owner's use of the property is not impaired at all, then maybe no compensation should be required. But that is not because the land was not taken. It is because justice may not require compensation for a taking that does not impair the owner's use at all.

Alan Romero, *Takings by Floodwaters*, 76 N.D. L. Rev. 785, 798 (2000). In other words, property owners who have been subject to flooding caused by government action deserve at least the chance to prove a takings claim. By creating a *per se* rule that temporary flooding can never result in a taking, the Federal Circuit has eviscerated the Just Compensation Clause.

Further, some courts, including this Court, have applied this analysis to acknowledge that just compensation is required that the context of temporary flooding cases. *See, e.g. Fitzpatrick v. Okanogan County*, 238 P.3d 1129, 1138 (Wash. 2010) (allowing inverse condemnation claim for damage

resulting from temporary flooding); *United States v. Cress*, 243 U.S. 316, 328 (1917) ("[I]t is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines the question [of] whether it is a taking."); *St. Bernard Parish v. United States*, 88 Fed. Cl. 528, 551 (Fed. Cl. 2009) (Fifth Amendment taking can occur in the context of flooding caused by public works).

In the case below, land was flooded over the course of six years and the government's decisions with respect to the flooding destroyed vast swaths of timber on the land. Thus, both the duration and the nature of the physical invasion suggest a physical taking. Yet the Federal Circuit ignored these results in order to arrive at a *per se* test that eliminates the just compensation remedy in a large number of flooding cases.

CONCLUSION

For the reasons stated above, the Court should grant certiorari and reverse the decision of the United States Court of Appeals for the Federal Circuit.

DATED: December 9, 2011.

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APPENDIX A

Cases in which NAHB has appeared as an *amicus curiae* or "of counsel" before this Court include:

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AMICUS CURIAE BRIEF

Supreme Court, U.S.
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No. 11-597

In the
Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,

Petitioner,

v.

UNITED STATES OF AMERICA,

Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

AMICUS CURIAE BRIEF OF PACIFIC LEGAL FOUNDATION AND CATO INSTITUTE IN SUPPORT OF PETITIONER

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QUESTION PRESENTED

Whether government actions that result in intermittent flooding over a period of eight years can give rise to a claim for damages under the Takings Clause.

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INTEREST OF AMICI CURIAE

Pursuant to Supreme Court Rule 37.2(a), Pacific Legal Foundation and the Cato Institute submit this brief amicus curiae in support of Petitioner Arkansas Game & Fish Commission (AGFC).[1]

Pacific Legal Foundation (PLF) was founded almost 40 years ago and is widely recognized as the largest and most experienced nonprofit legal foundation of its kind. PLF has participated in numerous cases before this Court both as counsel for parties and as amicus curiae. PLF attorneys litigate matters affecting the public interest at all levels of state and federal courts and represent the views of thousands of supporters nationwide who believe in limited government and private property rights. PLF attorneys participated as lead counsel in *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001); *Suitum v. Tahoe Regional Planning Agency*, 520 U.S. 725 (1997); and *Nollan v. California Coastal Commission*, 483 U.S. 825 (1987), and participated as amicus curiae in *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528 (2005), and *City of Monterey v. Del Monte Dunes at Monterey, Ltd.*, 526 U.S. 687 (1999). Because of its history and experience with regard to issues affecting private property, PLF

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[1] All parties have consented to the filing of this brief. Counsel of record for all parties received notice at least 10 days prior to the due date of Amici Curiae's intention to file this brief. Letters evidencing such consent have been filed with the Clerk of the Court.

No counsel for any party authored this brief in whole or in part and no person or entity made a monetary contribution specifically for the preparation or submission of this brief. No person other than Amici Curiae, their members, or their counsel made a monetary contribution to its preparation or submission.

believes that its perspective will aid this Court in considering AGFC's petition.

The Cato Institute was established in 1977 as a nonpartisan public policy research foundation dedicated to advancing the principles of individual liberty, free markets, and limited government. Cato's Center for Constitutional Studies was established in 1989 to help restore the principles of limited constitutional government that are the foundation of liberty. Toward those ends, Cato publishes books and studies, conducts conferences, publishes the annual *Cato Supreme Court Review*, and files amicus briefs, including in various cases concerning property rights. This case is of central concern to Cato because it implicates the safeguards the Fifth Amendment provides for the protection of property rights against uncompensated takings, irrespective of how they are characterized.

SUMMARY OF ARGUMENT

AGFC's petition for a writ of certiorari raises an important issue concerning the protections provided by the Takings Clause of the Fifth Amendment of the U.S. Constitution. Specifically, the petition asks whether a government decision that results in the repeated flooding of private property should be given different treatment under the Takings Clause than any other temporary taking. It should not. In *First English Evangelical Lutheran Church v. County of Los Angeles*, this Court surveyed its body of takings case law to determine that a temporary regulatory policy—just like a temporary physical invasion of private property—can rise to the level of a taking requiring just compensation. 482 U.S. 304, 318 (1987). *First English* explained that there was no reason to treat

temporary takings differently under the Fifth Amendment.

Temporary takings, like perpetual takings, take an interest in property. *First English*, 482 U.S. at 318 ("'Temporary' takings . . . are not different in kind from permanent takings, for which the Constitution clearly requires compensation."). The only difference is that a temporary taking puts private property to public use for a limited period of time. *Id.* This distinction, however, does not change the fact that a taking has occurred. *Id.* Thus, the only relevance that the duration of the government interference has in a takings claim is in measuring how much compensation is due. *Id.* Notwithstanding *First English* and all of the case law cited therein, however, the Federal Circuit below held that temporary flooding of private property can *never* constitute a taking if the physical invasion is the result of an ad hoc or temporary government policy. *Arkansas Game & Fish Commission v. United States*, 637 F.3d 1366, 1374, 1377-78 (Fed. Cir. 2011).

The Federal Circuit's decision is particularly objectionable—and particularly appropriate for review—because it departs from this Court's takings precedent by elevating the intent underlying a government policy to the single determinative factor in a temporary takings case. If left unreviewed, this ruling will provide a roadmap for government agencies to circumvent the protections of the Fifth Amendment by simply designating any policies that expose private property to increased risk of flood as "ad hoc," "interim," or "temporary." Amici urge this Court to grant AGFC's petition to resolve the conflicts created by the Federal Circuit's decision and to reaffirm the principle that the Fifth Amendment obligates the

government to pay just compensation for a temporary physical invasion of private property, regardless of the government's intent. This Court's reasoning in *First English* applies to all temporary takings, including temporary flood invasions caused by the government's ad hoc or temporary policies.

ARGUMENT

THE FEDERAL CIRCUIT'S ADOPTION OF A RULE THAT EXEMPTS FLOODING CAUSED BY TEMPORARY GOVERNMENT POLICIES FROM THE PROTECTIONS OF THE FIFTH AMENDMENT CONFLICTS WITH DECISIONS OF THIS COURT

The reason why the Federal Circuit's decision creates so many conflicts with this Court's takings precedent is that the lower court focused on the underlying intent of the government policy—rather than the character of the physical invasion itself[2]—to determine whether the government-induced flooding rose to the level of a taking. *Arkansas Game & Fish Commission*, 637 F.3d at 1377. The government's expectations when adopting a harmful policy cannot determine whether a taking has occurred. The Takings Clause of the Fifth Amendment provides, "nor shall private property be taken for public use, without just compensation." U.S. Const. amend. V. The obligation to pay just compensation arises the moment the government acts in a manner that subjugates a

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[2] *See United States v. Cress*, 243 U.S. 316, 328 (1917) ("[I]t is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines the question whether it is a taking.").

property owner's rights in his or her land. *First English*, 482 U.S. at 320 n.10; *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426, 435-37 (1982) (when the government causes a physical invasion or occupation of private property, it is categorically liable for just compensation). In the context of a physical invasion taking, the government's liability exists without regard to the reason for the invasion or the circumstances under which the property was acquired.[3] *See Loretto*, 458 U.S. at 426 (public purpose irrelevant); *Preseault v. United States*, 100 F.3d 1525, 1537 (Fed. Cir. 1996) (expectations not considered in physical invasion case). And just compensation for a taking must be made regardless of whether the interference continues for a period of months, years, or indefinitely. *See, e.g., United States v. Dow*, 357 U.S. 17, 18-19 (1958); *International Paper Co. v. United States*, 282 U.S. 399, 407-08 (1931). Simply put, where the government has taken private property, "no subsequent action by the government can relieve it of the duty to provide compensation for the period during which the taking was effective." *First English*, 482 U.S. at 321.

The Federal Circuit's decision upsets this Court's precedents regarding temporary takings (and property

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[3] It is well recognized that government-induced flooding that physically invades and occupies private property effects a taking and requires just compensation under the Takings Clause. *See Pumpelly v. Green Bay Co.*, 80 U.S. (13 Wall.) 166, 180-81 (1871); *see also Danforth v. United States*, 308 U.S. 271, 277-80 (1939); *Sanguinetti v. United States*, 264 U.S. 146, 149 (1924); *United States v. Cress*, 243 U.S. at 327-28. And in *United States v. Dickinson*, this Court recognized that government-induced flooding does not have to be a permanent condition of the land to rise to the level of a taking. 331 U.S. 745, 750-51 (1947).

owners' expectations) in two regards. First, the Federal Circuit held that flooding cases are so different from other types of takings that *First English*, and the cases cited therein, do not apply. *Arkansas Game & Fish Commission*, 637 F.3d at 1374. Second, the Federal Circuit held that the government's expectation that its policy be "ad hoc or temporary" means that any resulting physical invasion of private property can never result in a taking:

> [I]n determining whether a governmental decision to release water from a dam can result in a taking, we must distinguish between action which is by its nature temporary and that which is permanent. But in distinguishing between temporary and permanent action, we do not focus on a structure and its consequence. *Rather we must focus on whether the government flood control policy was a permanent or temporary policy.* Releases that are ad hoc or temporary cannot, by their very nature, be inevitably recurring [and therefore cannot constitute a taking].

Arkansas Game & Fish Commission, 637 F.3d at 1377 (emphasis added). Both conclusions warrant review by this Court.

A. A Flood Invasion Is Not Meaningfully Different from Other Physical Invasions

The Federal Circuit's conclusion that government-induced flooding is different from other types of physical invasions finds no support in takings case law. The sole basis for the lower court's conclusion was

that, when faced with an inverse condemnation suit based on flooding, courts must make the initial determination whether the claim alleges a tort or a taking.[4] *Arkansas Game & Fish Commission*, 637 F.3d at 1374. This inquiry, however, does not set flooding cases apart from any other type of physical invasion. Indeed, both the Federal Circuit and Federal Court of Claims regularly apply the tort/takings test to a wide range of claims alleging physical invasion takings.[5] *See, e.g.*, *Cary v. United States*, 552 F.3d 1373, 1376-77 (Fed. Cir. 2009) (fire suppression policies); *Moden v. United States*, 404 F.3d 1335, 1342 (Fed. Cir. 2005) (exposing property to chemical contaminant); *Placer Mining Co. v. United States*, 98 Fed. Cl. 681, 687-88 (2011) (channel construction that caused mine

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[4] The Federal Circuit has developed a test to distinguish torts from takings in physical invasion cases. The test requires the court to consider the nature of the government's action and other relevant information to determine (1) whether the government intended to invade a protected property interest or whether the asserted invasion was the direct, natural, or probable result of government activity, and (2) whether the interference was substantial and frequent enough to rise to the level of a taking. *See, e.g.*, *Cary v. United States*, 552 F.3d at 1376-77; *Moden v. United States*, 404 F.3d at 1342; *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1356 (Fed. Cir. 2003).

[5] The question whether a government action constituted a tort or a taking is a jurisdictional question, not a substantive part of the takings analysis. *Hansen v. United States*, 65 Fed. Cl. 76, 95 (2005); *Lockheed Martin Corp. v. United States*, 50 Fed. Cl. 550, 553 (2001), *aff'd*, 48 Fed. Appx. 752 (Fed. Cir. 2002). The test is intended to determine whether a federal district court or the Court of Federal Claims has subject matter jurisdiction. A tort claim against the government must be brought in the federal district courts (28 U.S.C. § 1346(b)); whereas, a taking claim seeking compensation must usually be filed in the Court of Federal Claims under the Tucker Act, 28 U.S.C. § 1491.

entrance to collapse); *Kam-Almaz v. United States*, 96 Fed. Cl. 84, 89 (2011) (seizure of laptop computer); *Banks v. United States*, 88 Fed. Cl. 665, 685-86 (2009) (erosion caused by government project). The Federal Circuit's decision to create a substantively different constitutional test for flooding cases finds no support in case law and warrants review by this Court.

B. The Government's Intent That Its Actions Be "Ad Hoc or Temporary" Is Not Determinative of Whether a Taking Has Occurred

The Federal Circuit's conclusion that "ad hoc or temporary" policies "by their very nature" can never give rise to a taking creates significant conflicts with this Court's takings case law. *Arkansas Game & Fish Commission*, 637 F.3d at 1377. The lower court was aware that it was creating a conflict when it created an exception to this Court's general rule that "if particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim." *Id.* at 1374 (citing *First English*, 482 U.S. at 328). Government-induced flooding undisputably falls within the realm of government actions that will constitute a taking if permanently continued. *See, e.g.*, *Pumpelly v. Green Bay Co.*, 80 U.S. (13 Wall.) at 180-81; *Danforth v. United States*, 308 U.S. at 277-80; *Sanguinetti v. United States*, 264 U.S. at 149; *United States v. Cress*, 243 U.S. at 327-28. Under *First English*, therefore, temporary government-induced flooding *can* give rise to a temporary takings claim. This conflict alone warrants review.

But the conflicts created by the Federal Circuit's decision are not limited to *First English*. For nearly a century, this Court has held the government liable for temporary takings based on temporary policies. The most obvious examples of temporary takings are found in the wartime seizure cases cited in *First English*. 482 U.S. at 318 (citing *Kimball Laundry Co. v. United States*, 338 U.S. 1, 3-4, 7, 16 (1949) (government commandeered laundry plant for less than four years, was required to pay rental value for occupied period of time plus depreciation and value of lost trade routes); *United States v. Petty Motor Co.*, 327 U.S. 372, 374, 380-81 (1946) (government compensated leaseholders for the temporary taking of their leaseholds for period of over two-and-a-half years); *United States v. General Motors Corp.*, 323 U.S. 373, 375 (1945) (government required to pay short-term rental value for taking portion of a building that had been leased by an automobile parts company)). There are additional decisions from this Court that confirm the viability of temporary takings claims. In *International Paper Co. v. United States*, for example, the United States, during World War I, issued a requisition order that allowed a third party's power plant to draw the whole of a river's water flow. 282 U.S. at 404-06, 408. At that time, International Paper leased a mill that had a right to use water drawn from the river via a canal. *Id.* at 404-05. Acting under the government's order, the third party power company stopped water from flowing into International Paper's canal, which interrupted International Paper's operation for a period of just over ten months. *Id.* at 405-06. This Court held that the government's decision to authorize the power company to interrupt the water flow effected

a physical taking requiring the payment of just compensation. *Id.* at 407.

In *United States v. Causby*, the government was issued a one-year lease with six-month renewals to use an airport for military purposes. 328 U.S. 256, 258-59 (1946). The term of the lease was for a total of five years (1942-1947), or until the end of World War II, whichever was earlier. *Id.* Operation of the airport, however, resulted in the frequent overflight of Causby's neighboring home and chicken farm. *Id.* at 259. The noise and glare caused by heavy, four-engine bombers, transports, and squads of fighters so interfered with the use and enjoyment of Causby's property and the commercial viability of the chicken farm, that this Court held that the government had taken an easement for which just compensation was due. *Id.* at 268. The fact that the taking may have been temporary did not change this Court's conclusion. *Id.* The duration of the taking was a matter to be resolved on remand when considering how much compensation was due. *Id.*

The decision below is so anomalous as to conflict even with earlier Federal Circuit decisions that applied *First English* to confirm the viability of temporary physical invasion takings claims. In *Hendler v. United States*, the Federal Circuit held that the duration of a physical invasion is not relevant to the question whether a taking has occurred. 952 F.2d 1364, 1376 (Fed. Cir. 1991); *see also Skip Kirchdorfer, Inc. v. United States*, 6 F.3d 1573, 1582-83 (Fed. Cir. 1993) (holding that the duration of a physical occupation is only relevant to the question of how much compensation is due). The *Hendler* court explained that the duration of a government act cannot be

determinative of whether a taking has occurred because every action is potentially temporary: "[T]he government when it has taken property by physical occupation could subsequently decide to return the property to its owner, or otherwise release its interest in the property." *Hendler*, 952 F.3d at 1376. *Hendler* held that a physical invasion that substantially interferes with a landowner's rights in his or her property may constitute a taking, regardless of whether the occupation lasts for a period of years or is indefinite:

> In [the physical takings] context, 'permanent' does not mean forever, or anything like it. A taking can be for a limited term—what is 'taken' is, in the language of real property law, an estate for years, that is, a term of finite duration as distinct from the infinite term of an estate in fee simple absolute.

Id. ("[N]o one would argue that [the temporary nature of a physical occupation] would somehow absolve the government of its liability for a taking during the time the property was denied to the property owner."). Given the body of case law recognizing the viability of a temporary takings claim, it is not surprising that the decision below conflicts with multiple decisions from this Court and the Federal Circuit. *See, e.g.*, *United States v. Dickinson*, 331 U.S. at 751 (government must pay just compensation for land that it flooded, even though the property owner had reclaimed most of the land prior to initiating the lawsuit); *Ridge Line, Inc. v. United States*, 346 F.3d at 1354-55 (reversing and remanding dismissal of flood invasion takings claim even though the landowner made improvement to his property that abated the flooding); *Cooper v. United*

States, 827 F.2d 762, 763-64 (Fed. Cir. 1987) (finding a taking even though the U.S. Army Corps of Engineers remedied the flooding after five years).

Among takings actions, it is possible that temporary, government-induced floods of a severity sufficient to trigger the just compensation requirement may be rare, but they do *in fact* occur. *Id.* Creating a rule that removes all temporary flood invasions resulting from ad hoc or temporary government policies from the protections of the Takings Clause is both unnecessary and overly broad. The Federal Circuit's novel rule does distinguish those flood invasions that sound in tort from those that effect a taking. *Arkansas Game & Fish Commission*, 637 F.3d at 1374. But, the rule still broadly excuses the government from its obligation to compensate landowners for temporary takings based solely on the government's characterization of its actions as "ad hoc," "temporary," or "interim." *Id.* at 1377. This Court should take review of this case to resolve the conflicts created by the Federal Circuit's decision.

CONCLUSION

It is indisputable that an ad hoc or interim government policy can harm private property just like any other policy. This includes policies that result in the temporary flooding of private land. This Court should grant AGFC's petition in order to reverse the

creation of a rule that exempts all such harms from the Fifth Amendment's just compensation requirement.

DATED: December, 2011.

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JOINT APPENDIX

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In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
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Plaintiff's Exhibit 262 - Letter from Michael Armstrong, Arkansas Game & Fish Commission (September 6, 1996) . . . . . JA 404

Plaintiff's Exhibit 266 - Memorandum by Robert Zachary (February 22, 1996) . . . . . JA 408

Plaintiff's Exhibit 268 - Memorandum by Lou Hausman (March 6, 1996) . . . . . JA 412

Plaintiff's Exhibit 476 - UAP Evaluation of Vegetation Management Requirements . . . . . JA 416

Plaintiff's Exhibit 491 - Dr. Jerry Overton Summary Tables and Graphs of Corning Gauge Data . . . . . JA 425

VOLUME 3

Plaintiff's Exhibit 500 - Dave Donaldson/Black River Wildlife Management Area Restoration and Management Plan Report by Dr. Mickey Heitmeyer Excerpt (June 2006) . . . . . JA 434

Plaintiff's Exhibit 506 - Dr. Jerry Overton Expert Rebuttal Report (May 7, 2008) . . . . . JA 467

Plaintiff's Exhibit 507 - Dr. Mickey Heitmeyer Supplemental Expert Report (May 7, 2008) . . . . . JA 481

Plaintiff's Exhibit 562 - Aerial Photograph of the Dave Donaldson Black River WMA (1983) . . . . . JA 487

Plaintiff's Exhibit 575 - US Army Corps of Engineers News Release No. 20-01 (April 9, 2001) . . . . . JA 488

Defendant's Exhibit 285 - US Army Corps of Engineers Clearwater Lake Water Control Manual Excerpt (July 1995) . . . . . JA 492

Defendant's Exhibit 306 - Dr. Sammy L. King Expert Report (April 11, 2008) . . . . . JA 533

Defendant's Exhibit 308 - WMA Timber Sale Data (April 11, 2008) . . . . . JA 567

Defendant's Exhibit 310 - Expert Report of Dr. Wade L. Nutter (April 11, 2008) . . . . . JA 574

Joint Exhibit 6 - Final Environmental Assessment by Parsons Engineering Science, Inc. for the U.S. Army Corps of Engineers Excerpt (February 2000) . . . . . JA 685

Joint Exhibit 20 - Draft Dave Donaldson Black River Wildlife Management Area Review of Available Data and Recommendations (April 20, 2001) . . . . . JA 728

Joint Stipulated Findings of Fact, Filed by All Parties (December 19, 2008) . . . . . JA 731

The following opinions, decisions, judgments, orders, and exhibits have been omitted in printing this joint appendix because they appear on the following pages in the appendix to the Petition for Certiorari:

Appendix A: Opinion, United States Court of Appeals for the Federal Circuit (March 30, 2011) 1a

Appendix B: Opinion and Order, United States Court of Federal Claims (July 1, 2009) 38a

Appendix C: Order, On Petition for Panel Rehearing and Rehearing En Banc, United States Court of Appeals for the Federal Circuit (August 11, 2011) 162a

Appendix D: Jurisdictional Statutes
28 U.S.C. § 1295(a)(3) 180a
28 U.S.C. § 1346(a)(2) 180a
Tucker Act, c. 359, 24 Stat. 505
28 U.S.C. § 1491(a)(1), (c) . 181a
Flood Control Act, c. 569, 45 Stat. 535
33 U.S.C. § 702c 182a

Appendix E: U.S. Army Corps of Engineers E-mail Exchange (March 29-30, 2001) 184a

Appendix F: Principal Brief of Defendant-Appellant United States [Excerpts], United States Court of Appeals for the Federal Circuit (January 2010) 191a

RELEVANT DOCKET ENTRIES

UNITED STATES COURT OF FEDERAL CLAIMS
No. 1:05-cv-00381-cfl

Arkansas Game & Fish Commission v. USA

Date Filed	#	Docket Text
03/18/2005	1	COMPLAINT against USA (ARM) (Filing fee $150, Receipt number 062565), filed by ARKANSAS GAME & FISH COMMISSION. Answer Due by 5/17/2005.(dw1) (Entered: 03/21/2005)
		* * *
05/17/2005	4	ANSWER to 1 Complaint, filed by USA.Service: 5/17/2005. JPSR due by 7/8/2005.(mb2,) (Entered: 05/24/2005)
		* * *
09/12/2005	11	MOTION for Partial Voluntary Dismissal, filed by ARKANSAS GAME & FISH COMMISSION. Service: 9/8/2005 Dispositive Motion Response due by 10/11/2005.(mb2,) (Entered: 09/15/2005)
09/21/2005	12	ORDER denying 5 Motion to Partially Dismiss, granting 11 Motion for Partial Voluntary Dismissal. Signed by Judge

		Charles F. Lettow. (mb2,) (Entered: 09/23/2005)
		* * *
09/29/2008	65	Memorandum of Contentions of Fact and Law, filed by ARKANSAS GAME & FISH COMMISSION. (Greathouse, Julie) (Entered: 09/29/2008)
		* * *
10/27/2008	75	Memorandum of Contentions of Fact and Law, filed by USA. (Shapiro, William) (Entered: 10/27/2008)
11/07/2008	76	MOTION in Limine *to Exclude Plaintiff's Trial Exhibit 493*, filed by USA.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit 1)(Shapiro, William) (Entered: 11/07/2008)
11/07/2008	77	MOTION in Limine *to Exclude Burak*, filed by ARKANSAS GAME & FISH COMMISSION.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E, # 6 Exhibit F, # 7 Exhibit G, # 8 Exhibit H, # 9 Exhibit I, # 10 Exhibit J, # 11 Exhibit K, # 12 Exhibit L)(Greathouse, Julie) (Entered: 11/07/2008)
11/07/2008	78	MOTION in Limine *to Exclude Expert Testimony and Reports from Richard Watts and*

		Martin Blaney, filed by USA.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit 1 to 8)(Shapiro, William) (Entered: 11/07/2008)
11/07/2008	79	MOTION in Limine *to Exclude Expert Testimony and Reports from James Baker, James Foster, and Phillip Livingston*, filed by USA.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit 1 to 7, # 2 Exhibit 8 to 15, # 3 Exhibit 16 to 20)(Shapiro, William) (Entered: 11/07/2008)
11/07/2008	80	MOTION in Limine *to Exclude Nutter*, filed by ARKANSAS GAME & FISH COMMISSION.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E, # 6 Exhibit F, # 7 Exhibit G, # 8 Exhibit H, # 9 Exhibit I, # 10 Exhibit J, # 11 Exhibit K, # 12 Exhibit L, # 13 Exhibit M, # 14 Exhibit N, # 15 Exhibit O, # 16 Exhibit P, # 17 Exhibit Q, # 18 Exhibit R, # 19 Exhibit S, # 20 Exhibit T, # 21 Exhibit U)(Greathouse, Julie) (Entered: 11/07/2008)
11/07/2008	81	MOTION in Limine *to Exclude Grissino-Mayer*, filed by ARKANSAS GAME & FISH

		COMMISSION.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D)(Greathouse, Julie) (Entered: 11/07/2008)
11/07/2008	82	MOTION in Limine *to Exclude Williams Errata Sheet*, filed by ARKANSAS GAME & FISH COMMISSION.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C)(Greathouse, Julie) (Entered: 11/07/2008)
11/07/2008	83	MOTION in Limine *to Exclude Williams' Report, Opinions and Testimony*, filed by ARKANSAS GAME & FISH COMMISSION.**Response due by 11/24/2008.** (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E, # 6 Exhibit F, # 7 Exhibit G, # 8 Exhibit H)(Greathouse, Julie) (Entered: 11/07/2008)
11/12/2008	84	RESPONSE to 77 MOTION in Limine *to Exclude Burak*, filed by USA.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Exhibit 5, # 6 Exhibit 6)(Bryant, Steven) (Entered: 11/12/2008)

11/12/2008	85	RESPONSE to 80 MOTION in Limine *to Exclude Nutter*, filed by USA.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit 1, # 2 Exhibit 2-12)(Shapiro, William) (Entered: 11/12/2008)
11/12/2008	86	RESPONSE to 81 MOTION in Limine *to Exclude Grissino-Mayer*, filed by USA.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit 1-6)(Shapiro, William) (Entered: 11/12/2008)
11/12/2008	87	RESPONSE to 83 MOTION in Limine *to Exclude Williams' Report, Opinions and Testimony*, filed by USA.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Exhibit 5, # 6 Exhibit 6)(Bryant, Steven) (Entered: 11/12/2008)
11/12/2008	88	RESPONSE to 82 MOTION in Limine *to Exclude Williams Errata Sheet*, filed by USA.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit 1 (Part 1), # 2 Exhibit 1 (Part 2), # 3 Exhibit 1 (Part 3), # 4 Exhibit 1 (Part 4), # 5 Exhibit 1 (Part 5), # 6 Exhibit 1 (Part 6), # 7 Exhibit 1 (Part 7), # 8 Exhibit 1 (Part 8), # 9

		Exhibit 1 (Part 9), # 10 Exhibit 1 (Part 10), # 11 Exhibit 2-5)(Shapiro, William) (Entered: 11/12/2008)
11/12/2008	89	RESPONSE to *Motion in Limine to Exclude Trial Exhibit 493*, filed by ARKANSAS GAME & FISH COMMISSION. (Greathouse, Julie) (Entered: 11/12/2008)
11/12/2008	90	RESPONSE to 78 MOTION in Limine *to Exclude Expert Testimony and Reports from Richard Watts and Martin Blaney*, filed by ARKANSAS GAME & FISH COMMISSION.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E)(Greathouse, Julie) (Entered: 11/12/2008)
11/12/2008	91	RESPONSE to 79 MOTION in Limine *to Exclude Expert Testimony and Reports from James Baker, James Foster, and Phillip Livingston*, filed by ARKANSAS GAME & FISH COMMISSION.**Reply due by 11/24/2008.** (Attachments: # 1 Exhibit B, # 2 Exhibit C, # 3 Exhibit D, # 4 Exhibit E, # 5 Exhibit G, # 6 Exhibit H, # 7 Exhibit I, # 8 Exhibit J, # 9 Exhibit K, # 10 Exhibit A, # 11 Exhibit

		F)(Greathouse, Julie) (Entered: 11/12/2008)
11/17/2008	92	REPLY to Response to Motion re 78 MOTION in Limine *to Exclude Expert Testimony and Reports from Richard Watts and Martin Blaney*, filed by USA. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E, # 6 Exhibit F, # 7 Exhibit G)(Bryant, Steven) (Entered: 11/17/2008)
11/17/2008	93	REPLY to Response to Motion re 76 MOTION in Limine *to Exclude Plaintiff's Trial Exhibit 493*, filed by USA. (Shapiro, William) (Entered: 11/17/2008)
11/17/2008	94	REPLY to Response to Motion re 79 MOTION in Limine *to Exclude Expert Testimony and Reports from James Baker, James Foster, and Phillip Livingston*, filed by USA. (Attachments: # 1 Exhibit 21 to 28)(Shapiro, William) (Entered: 11/17/2008)
11/17/2008	95	REPLY to Response to Motion re 82 MOTION in Limine *to Exclude Williams Errata Sheet*, filed by ARKANSAS GAME & FISH COMMISSION. (Attachments: # 1 Exhibit D, # 2 Exhibit

		E)(Greathouse, Julie) (Entered: 11/17/2008)
11/17/2008	96	REPLY to Response to Motion re 83 MOTION in Limine *to Exclude Williams' Report, Opinions and Testimony and Dr. Henri Grissino-Mayer*, filed by ARKANSAS GAME & FISH COMMISSION. (Attachments: # 1 Exhibit I, # 2 Exhibit J)(Greathouse, Julie) (Entered: 11/17/2008)
11/17/2008	97	REPLY to Response to Motion re 81 MOTION in Limine *to Exclude Grissino-Mayer*, filed by ARKANSAS GAME & FISH COMMISSION. (Attachments: # 1 Exhibit E)(Greathouse, Julie) (Entered: 11/17/2008)
11/17/2008	98	REPLY to Response to Motion re 77 MOTION in Limine *to Exclude Burak*, filed by ARKANSAS GAME & FISH COMMISSION. (Attachments: # 1 Exhibit M)(Greathouse, Julie) (Entered: 11/17/2008)
11/17/2008	99	REPLY to Response to Motion re 80 MOTION in Limine *to Exclude Nutter*, filed by ARKANSAS GAME & FISH COMMISSION. (Attachments: # 1 Exhibit A-F)(Greathouse, Julie) (Entered: 11/17/2008)
11/19/2008	100	ORDER denying 76 defendant's motion in limine to

		exclude plaintiff's trial exhibit 493; denying 77 plaintiff's motion in limine to exclude the report, opinions, and testimony of Steven Burak; and denying 78 defendant's motion in limine to exclude trial testimony from Richard Watts and Martin Blaney and to exclude plaintiff's exhibits 501, 502, and 503. Signed by Judge Charles F. Lettow. (nwb) (Entered: 11/19/2008)
11/20/2008	101	ORDER denying 79 defendant's motion in limine to exclude trial testimony from James Baker, James Foster, and Philip Livingston and to exclude plaintiff's exhibits 79, 80, 504, and 505; and denying 82 plaintiff's motion in limine to exclude the changes made to a transcript of a deposition by Wayne Williams. Signed by Judge Charles F. Lettow. (nwb) (Entered: 11/20/2008)
		* * *
11/21/2008	103	ORDER denying 80 plaintiff's motion in limine to exclude the report, opinions, and testimony of Dr. Wade Nutter; denying 81 plaintiff's motion in limine to exclude the testimony and expert report of Dr. Henri Grissino-Mayer; and

		denying 83 plaintiff's motion in limine to exclude the testimony and reports of Wayne Williams and Henri Grissino-Mayer. Signed by Judge Charles F. Lettow. (nwb) (Entered: 11/21/2008)
11/24/2008	104	PRETRIAL ORDER: **Trial will be held from 12/1/2008 through 12/12/2008 at the Richard Sheppard Arnold United States Courthouse, in Little Rock, Arkansas, before Judge Charles F. Lettow. This order constitutes the final pre-trial order issued pursuant to RCFC 16(e).** Signed by Judge Charles F. Lettow. (nwb) (Entered: 11/24/2008)
		* * *
12/15/2008		Minute Entry for trial held in Little Rock, AR from 12/1/2008 to 12/12/2008, before Judge Charles F. Lettow. [Total number of days of proceeding: 11]. Official record of proceeding taken by court reporter. (Click HERE for link to Court of Federal Claims web site forms page for information on ordering: certified transcript from reporter or certified transcript of proceeding from official

		digital recording.) (nwb) (Entered: 12/15/2008)
		* * *
12/19/2008	112	STIPULATION *JOINT STIPULATED FINDINGS OF FACT*, filed by all parties. (Greathouse, Julie) (Entered: 12/19/2008)
		* * *
12/23/2008	114	TRANSCRIPT of Proceedings (pages 1-241/340) held on December 1, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 12/30/2008. Redacted Transcript Deadline set for 1/23/2009. Release of Transcript Restriction set for 3/23/2009. (dw1) (Entered: 12/23/2008)
		* * *
12/23/2008	116	TRANSCRIPT of Proceedings (pages 1557-1731/1807) held on December 6, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request

		Transcripts. Notice of Intent to Redact due 12/30/2008. Redacted Transcript Deadline set for 1/23/2009. Release of Transcript Restriction set for 3/23/2009. (dw1) (Entered: 12/24/2008)
		* * *
12/29/2008	119	TRANSCRIPT of Proceedings (pages 341-640/735) held on December 2, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	121	TRANSCRIPT of Proceedings (pages 736-1065/1138) held on December 3, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline

		set for 1/29/2009. Release of Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	123	TRANSCRIPT of Proceedings (pages 1139-1394/1530) held on December 4, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	125	TRANSCRIPT of Proceedings (pages 1531-1542/1556) held on December 5, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of

		Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	127	TRANSCRIPT of Proceedings (pages 1808-2106/2204) held on December 8, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	129	TRANSCRIPT of Proceedings (pages 2205-2545/2615) held on December 9, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for

		3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	131	TRANSCRIPT of Proceedings (pages 2616-2987/3020) held on December 10, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	133	TRANSCRIPT of Proceedings (pages 3021-3389/3431) held on December 11, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for

		3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
12/29/2008	135	TRANSCRIPT of Proceedings (pages 3432-3559) held on December 12, 2008 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 1/5/2009. Redacted Transcript Deadline set for 1/29/2009. Release of Transcript Restriction set for 3/30/2009. (dw1) (Entered: 01/06/2009)
		* * *
02/19/2009	140	POST TRIAL BRIEF, filed by ARKANSAS GAME & FISH COMMISSION. (Greathouse, Julie) (Entered: 02/19/2009)
03/27/2009	141	POST TRIAL BRIEF, filed by USA. (Attachments: # 1 Appendix A, # 2 Appendix B)(Shapiro, William) (Entered: 03/27/2009)
		* * *
04/20/2009	145	POST TRIAL BRIEF *REPLY*, filed by ARKANSAS GAME & FISH COMMISSION. (Greathouse, Julie) (Entered: 04/20/2009)

04/27/2009		Minute Entry for proceeding held in Washington, D.C. on 4/27/2009 before Judge Charles F. Lettow: closing argument. [Total number of days of proceeding: 1]. Official record of proceeding taken by court reporter. (Click HERE for link to Court of Federal Claims web site forms page for information on ordering: certified transcript from reporter or certified transcript of proceeding from official digital recording.) (nwb) (Entered: 04/27/2009)
		* * *
05/12/2009	147	TRANSCRIPT of Proceedings (pages 1-120) held on April 27, 2009 before Judge Charles F. Lettow. Procedures Re: Electronic Transcripts and Redactions. For copy, contact Heritage Court Reporting, (202) 628-4888. Forms to Request Transcripts. Notice of Intent to Redact due 5/19/2009. Redacted Transcript Deadline set for 6/12/2009. Release of Transcript Restriction set for 8/10/2009. (dw1) (Entered: 05/13/2009)
07/01/2009	148	PUBLISHED OPINION. The Commission has suffered a

		temporary taking for which just compensation is due. The court awards the Commission as of the end of the takings period, October 11, 2000, $5,602,329.56, measured by timber lost and destroyed, and $176,428.34 in additional damages for a regeneration program to address areas severely affected by invasive wetland species, as of October 11, 2001. The court also awards interest on those amounts at the ten-year Treasury STRIPS rate from these dates to the date the judgment is actually paid. The Clerk is directed to enter judgment in accord with RCFC 54(b). Signed by Judge Charles F. Lettow. (nwb) (Entered: 07/01/2009)
	* * *	
07/02/2009	149	JUDGMENT entered, as provided in Rule 54(b), that the plaintiff recover of and from the United States as of the end of the takings period, October 11, 2000 (the end of the growing season), the amount of $5,602,329.56, measured by timber lost and destroyed, and the amount of $176,428.34 in additional

		damages for a regeneration program to address areas severely affected by invasive wetland species, as of October 11, 2002. Interest is also awarded on these amounts at the ten-year Treasury STRIPS rate from these dates to the date the judgment is actually paid. (lld) (Entered: 07/02/2009)
07/14/2009	150	CERTIFIED TRANSCRIPT OF JUDGMENT, forwarded to Julie Dewoody Greathouse. (bre,) (Entered: 07/15/2009)
08/27/2009	151	NOTICE OF APPEAL, filed by USA. Copies to judge, opposing party and CAFC. (hw1,) (Entered: 08/28/2009)
09/10/2009	152	NOTICE OF CROSS APPEAL as to 149 Judgment, filed by ARKANSAS GAME & FISH COMMISSION. Filing fee$ 455 and receipt number 069995. (dw1) (Entered: 09/10/2009)
		* * *
12/21/2010		Appeal record sent to CAFC. (hw1,) (Entered: 12/22/2010)
03/30/2011	154	Decision of the Court of Appeals for the Federal Circuit. The mandate will be issued in due course, approximately by 5/24/2011. (hw1) (Entered: 03/30/2011)

04/01/2011		Appeal record returned from CAFC. (hw1) (Entered: 04/01/2011)
09/19/2011	155	MANDATE of CAFC reversing the Claims Court's decision 148 that the United States had taken a flowage easement on the Commission's land without just compensation. NUNC PRO TUNC 8/18/2011 (hw1) (Entered: 09/19/2011)

United States Court of Appeals for the Federal Circuit

No. 2009-5121/2010-5029

Arkansas Game & Fish Commission v. USA

Date	Entry	History
1/4/2010		Appellant Principal Brief
4/26/2010		Appellee or Cross Appellant Principal Brief
7/23/2010		Appellant Reply Brief
8/16/2010		Cross Appellant Reply Brief
10/28/2010		Appendix
12/8/2010		Oral Argument Date
3/30/2011		Disposition: Reversed; by Panel
8/11/2011	51	Precedential Order: Petition for panel rehearing and rehearing en banc is denied. By: Court En Banc. PER CURIAM. Dyk, w/ whom Gajarsa and Linn, join, concurs in denial of petition for rehearing en banc. Moore w/ whom O'Malley and Reyna (con't) SERVICE : by Court on 8/11/2011

8/11/2011	52	(con't fr. # 51) join, dissents from denial of petition for rehearing en banc. Newman, dissents from denial of petition for rehearing en banc. Hon. Ronald M. Whyte, N.D. CA, did not participate in decision of whether to rehear appeal en banc
8/18/2011		Mandated

* * *

IN THE UNITED STATES COURT OF FEDERAL CLAIMS

No. 05-381L

[Filed March 18, 2005]

ARKANSAS GAME & FISH COMMISSION
PLAINTIFF

v.

THE UNITED STATES
DEFENDANT

COMPLAINT

Comes now the Arkansas Game & Fish Commission ("AGFC" or "the Commission"), through its undersigned attorneys, and for its Complaint states as follows:

PARTIES, JURISDICTION AND VENUE

1. Plaintiff Arkansas Game and Fish Commission is a constitutionally independent agency of the State of Arkansas. See Ark. Const., Amend. 35. The mission of the Arkansas Game and Fish Commission is to wisely manage all of the fish and wildlife resources of Arkansas while providing maximum enjoyment for the people of the State. The plaintiff, Arkansas Game and Fish Commission, owns the Dave Donaldson Black River Wildlife Management Area ("Black River WMA").

2. Defendant United States, through its agency, the U.S. Army Corps of Engineers ("Corps") has responsibility for, among other things, the operation of Clearwater Lake as a flood control project. The Corps owns and operates Clearwater Lake. The Corps also serves as the regulatory agency for Clearwater Lake. The Reservoir Control Section of the Little Rock District's Hydrology and Hydraulics Branch is responsible for the Lake's regulation.

3. This complaint states a cause of action for taking of property without just compensation in violation of the Fifth Amendment to the United States constitution, and requests money damages and injunctive relief. All of the claims arise from intentional and unauthorized releases of water from Clearwater Lake which have caused and are causing extensive damage to the timber and soil resources located on the Black River WMA.

4. This Court has jurisdiction and is the proper venue for this action pursuant to 28 U.S.C. § 1491.

FACTUAL BACKGROUND

5. The Black River WMA was originally named after the Black River that flows through the area. Black River WMA is comprised of approximately 25,000 acres of Commission-owned land in Clay, Randolph and Green counties in Arkansas that make up the Black River WMA. The majority of the area was purchased in various tracts during the 1950s and 1960s with state and federal funds, as part of an effort to preserve bottomland hardwood habitat and provide top quality waterfowl hunting to the general public in

Arkansas. AGFC continues to purchase tracts for inclusion in the WMA today.

6. When AGFC began acquiring Black River lands, wetland habitat was disappearing at an alarming rate because of an ever-increasing agricultural demand for rice and soybean land. Due to AGFC's efforts to preserve it, Black River WMA represents a significant portion of the remaining bottomland hardwood habitat in Eastern Arkansas and provides critical wintering habitat for many thousands of migratory waterfowl annually. The area also provides critical habitat to numerous species of neotropical migrant birds. Because of its importance to the Mississippi Flyway waterfowl population, the AGFC emphasizes waterfowl management on Black River WMA. The Black River WMA provides some of the finest bottomland hardwood duck habitat in Arkansas and the United States.

7. The hardwood forests are comprised of several species. The dominant species are Nuttall oak, overcup oak, pin oak and water oak. Bald cypress, tupelo and willow are also common along the sloughs that form a network of waterways throughout the area.

8. Clearwater Lake is located on the Black River in Missouri, upstream of the Black River WMA. It is owned and controlled by the Corps.

9. The construction of Clearwater Lake was authorized by the Flood Control Act of 1938 for flood control and other purposes in the White River Basin. Clearwater Dam was completed in 1948, and is located on the Black River at river mile 257.4 in Reynolds and Wayne Counties in southeastern Missouri. The dam

lies about 32 miles northwest of Poplar Bluff, Missouri. Clearwater Dam regulates the flow from 898 square miles of drainage area. The Corps operates Clearwater Lake to reduce flooding along the Black River, primarily for the benefit of flood-prone agricultural land.

10. Corps projects, including Clearwater Lake, are required to be operated pursuant to formal Water Control Plans and reservoir regulation schedules. Water Control Plans must conform with objectives and specific provisions of authorizing legislation and applicable Corps reports, and must include any applicable authorities established after project construction. The Corps must prepare the Water Control Plan with appropriate consideration to all applicable Congressional Acts relating to operation of Federal facilities including, without limitation, the Fish and Wildlife Coordination Act (Pub. L. 85-624), the National Environmental Policy Act (Pub. L. 91-190), and the Clean Water Act of 1977 (Pub. L. 95-217), as amended. Thorough analysis and testing studies must be made as necessary to establish the optimum Water Control Plan within prevailing constraints. 33 C.F.R. § 222.5(f).

11. The required Water Control Plan for Clearwater Lake is set forth in the Clearwater Lake Water Control Manual ("the Manual"). The Corps released the original Manual for Clearwater Lake in 1953, and revised the Manual in 1995. The Manual documents the required plan of water control ("Water Control Plan") and provides guidance to Corps personnel concerned with, or responsible for, regulation of the Lake during the life of the project.

12. Both the 1953 and the 1995 (currently authorized) Water Control Plans for Clearwater Lake prescribe that releases of lake water are to be sized and timed such that those releases, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a stage at the Poplar Bluff, Missouri gage (the official gaging station) of 11.5 feet during the period from December 1 through March 31 (nonagricultural season) and 10.5 feet during the period April 1 through November 30 (agricultural season). The later period is considered to constitute most of the growing season for bottomland hardwood tree species.

13. Lake regulation under the approved Water Control Plan results in a rapid release of stored lake water each spring and short-term flooding downstream along the Black River. The rapid release of water in the spring simulates natural flooding that had occurred along the floodplain for centuries (prior to dam construction), but at controlled rates and levels. Floodwaters generally recede by late May of each year and the hardwood forests growing in the floodplain thrived under this Water Control Plan so long as it was followed (for about 35 years).

14. The Corps generally followed the authorized Water Control Plan until 1993. Beginning sometime in 1993 and continuing through 2000, the Corps intentionally deviated from the authorized Water Control Plan for Clearwater Lake, in violation of regulatory and statutory requirements. Although the Corps refers to the deviation as an "authorized deviation," the Corps failed and refused to follow its own regulations and other applicable Federal laws

requiring, among other things: (a) public notice and comment, (b) coordination with appropriate state and federal agencies (particularly the Arkansas Game & Fish Commission and the U.S. Fish & Wildlife Service), and (c) thorough analysis and testing studies to support the proposed change in the Water Control Plan. See 33 C.F.R. § 222.5(f) and (g). The Corps made no attempt to comply with the requirements of conducting a thorough environmental impact assessment pursuant to the National Environmental Policy Act ("NEPA") at or before the time it implemented the unauthorized deviation.

15. The Corps' unauthorized deviation from the Water Control Plan that began in 1993 stipulates that releases will be sized and timed such that, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a gage reading of 11.5 feet at the Poplar Bluff, Missouri gage from December through mid-May, and 4 to 10.5 feet from mid-May through November, depending on lake levels. The Corps made no attempt to investigate what potential impacts the unauthorized deviation would have on the extensive bottomland hardwood forests on Black River WMA.

16. Contrary to the authorized Water Control Plan, the unauthorized deviation implemented by the Corps in 1993 involved a limited or restricted release of lake waters from mid-May through November, and often resulted in prolonged flooding of forest communities on the Black River WMA. Flooding under this regime extended well into the growing season, and flood waters frequently could not be drained from bottomland forest communities until mid- to late-August. As a result, soils on much of Black River WMA

remained saturated for 10 to 11 months of the year in large areas of the WMA.

17. In 1999, after operating under the unauthorized deviation for about 6 years, the Corps initiated an attempt to amend the Water Control Plan. The Corps tried to obtain regulatory approval for the deviation in order to come into compliance with NEPA and applicable Corps regulations. A draft environmental assessment of the proposed changes was completed and sent to various state and federal agencies for comment in October 1999. While the Corps was seeking regulatory approval, it continued to operate Clearwater Dam in violation of the approved Water Control Plan.

18. The AGFC provided comments to the Corps opposing the proposed plan that would permanently change the water releases on Clearwater Lake, and pointing out significant flooding problems on the WMA. These comments were incorporated into a Corps document titled Draft Environmental Assessment ("EA") for Clearwater Lake Water Control Plan. The United States Fish and Wildlife Service also provided comments to the Corps, concurring with the AGFC. Both agencies expressed serious concerns regarding impacts of the proposed plan as well as the impacts that were occurring from the Corps' unauthorized deviation from the Water Control Plan. Despite the presentation of information that the proposed modification of the Water Control Plan negatively impacted Black River WMA, the Corps' draft EA proposed a "Finding of No Significant Impact" ("FONSI").

19. The Corps' issuance of a FONSI in spite of substantial evidence to the contrary precipitated a number of meetings between AGFC and the Corps. In December of 1999, the AGFC furnished additional information and data to the Corps demonstrating that the proposed plan had serious negative impacts on bottomland hardwoods in the Black River WMA.

20. In February 2000, the Corps released the Final EA for the Clearwater Lake Water Control Plan. The proposed action, as described in the Final EA, was to update the current water control plan to include the water regulation procedures that the Corps had been using since 1993. The findings of the Final EA stated that the proposed action had the potential for significant impacts on natural resources. The Corps further determined that the proposed water control plan that had been used since 1993 would result in 45 days during the growing season (approximately 25%) of a typical year having potential for extended flooding of hardwoods growing in the Black River WMA. Flooding for such an extended period during the growing season represents a significant adverse impact to species composition and causes serious habitat deterioration on the WMA. As a result of the information presented by AGFC, the Corps concluded under "Findings" in the Final EA that a finding of no significant impact could not be supported, and that to continue with the proposed action would require the preparation of a full Environmental Impact Statement. In 2000, the Corps returned to the original (approved) Water Control Plan for Clearwater Lake.

21. The Corps' intentional deviation from the approved Water Control Plan has directly caused gradual and progressive mortality and degradation of

many of the oak stands in the WMA since 1993, due to extensive and repeated flooding during the growing season. Mortality in some oak species has ranged as high as 80% and crown die-back (a symptom of rapid decline leading to mortality) is demonstrated in over 50% of the remaining living trees in some units on the WMA. Historical data from timber surveys on the WMA in the mid-1980s and early 1990s (prior to the Corps' intentional deviation from the Water Control Plan) establish that timber mortality in these stands was averaging only 1 to 2%.

22. The current damages resulting from losses to merchantable timber on Black River WMA exceed eight million dollars ($8,000,000), and losses continue to increase as timber dies from the chronic effects of prolonged growing-season flooding caused by the Corps' intentional deviations from the authorized Water Control Plan.

COUNT I. Taking of Timber in Violation of Fifth Amendment

23. All preceding paragraphs of this complaint are incorporated herein by reference.

24. At all times relevant to this complaint, AGFC owned the Black River WMA and the timber on that WMA.

25. From 1993 to 2000, the Corps authorized and directed a pattern of water releases from Clearwater Lake that caused repeated flooding of bottomland hardwood timber during the growing season on Black River WMA.

26. The Corps' intentional pattern of water releases from Clearwater Lake gradually has caused extensive death and destruction of timber growing on the Black River WMA, and has placed many other trees in a condition of rapid decline. The lingering effects of past prolonged flooding during the growing season will continue to destroy timber on Black River WMA.

27. The destruction of AGFC's valuable timber resources on Black River WMA constitutes a taking of private property for public use, for which no compensation has been made by the United States.

28. Timber constitutes a property interest, the destruction of which is a compensable taking under the Fifth Amendment to the United States Constitution.

29. The United States should be ordered to pay AGFC fair compensation for the timber it has taken without just compensation in an amount exceeding eight million dollars ($8,000,000), which total amount will be more accurately proven at trial.

Count II – Destruction of Soil Structure and Hydrology

30. All preceding paragraphs of this complaint are incorporated herein by reference.

31. At all times relevant to this complaint, AGFC owned the Black River WMA and the soils on the WMA that support the growth of bottomland hardwood timber.

32. From 1993 to 2000, the Corps authorized and directed a pattern of water releases from Clearwater Lake that caused repeated flooding of the bottomland soils on Black River WMA. The Corps maintained water levels on and adjacent to the Black River WMA that have changed the soil structure and hydrology such that it is not conducive to the growth of bottomland hardwood timber.

33. The destruction of AGFC's valuable bottomland soil resources on Black River WMA constitutes a taking of private property for public use, for which no compensation has been made by the United States.

34. Soil resources constitute a property interest, the destruction of which is a compensable taking under the Fifth Amendment to the United States Constitution.

35. In addition to compensation for timber destruction, the United States should be ordered to pay for (1) the costs of soil restoration necessary to sustain growth of a new bottomland timber resource, and (2) all other necessary costs of remediating the soil so that it will grow and sustain the same type of bottomland timber that was taken by the Corps' action, and to prevent further destruction and degradation of bottomland timber and its habitat, which amount will be more particularly proven at trial.

Injunctive Relief

36. All preceding paragraphs of this complaint are incorporated herein by reference.

37. The Corps deviated from its authorized Water Control Plan for a number of years, in violation of existing regulatory requirements. In 2002, the Corps agreed to return to its original Water Control Plan.

38. AGFC requests that this Court enjoin the Corps from further deviations of the Water Control Plan, except in strict compliance with all applicable statutes and regulations including, without limitation, all applicable requirements under the National Environmental Policy Act.

WHEREFORE, the Arkansas Game and Fish Commission prays for judgment against the United States in an amount sufficient to fairly compensate it for the taking of timber resources, in an amount exceeding eight million dollars, and destruction of bottomland soil resources on the Black River WMA, in an amount to be proven at trial; to permanently enjoin the U.S. Army Corps of Engineers from further deviations from the Water Control Plan except in strict compliance with applicable laws and regulations, for reasonable attorney's fees, costs, and expenses, and for all other just and proper relief to which it is entitled.

Respectfully submitted

By:/s/_____

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Date of Signing: March 17, 2005

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ATTORNEYS FOR PLAINTIFF
ARKANSAS GAME & FISH COMMISSION

**IN THE UNITED STATES
COURT OF FEDERAL CLAIMS**

**No 05-381L
Judge Charles F. Lettow**

[Filed May 17, 2005]

ARKANSAS GAME & FISH COMMISSION,)
)
Plaintiff)
V.)
)
THE UNITED STATES OF AMERICA,)
Defendant)

ANSWER

Defendant, United States of America, in answer to Plaintiff's complaint, hereby admits, denies, and avers as follows:

1. Defendant admits the allegations in sentence one of paragraph 1. Defendant is without knowledge or information sufficient to form a belief as to the truth or falsity of the remaining allegations in paragraph 1.

2. Defendant admits the allegations contained in the first two sentences of paragraph 2 of plaintiff's complaint. In response to the allegations of the third and fourth sentences in paragraph 2, Defendant avers that it is the Reservoir Control Branch of the Operations Division of the Army Corps of Engineers that is responsible for the regulation of Clearwater Lake.

3. The allegations in the first sentence of paragraph 3 are a characterization of plaintiff's complaint to which no response is required; to the extent matters of fact are alleged, they are denied. The Defendant denies the allegations contained in the second sentence of paragraph 3.

4. The allegations in paragraph 4 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied. In further response to the first paragraph, Defendant admits that the Tucker Act, 28 U.S.C. § 1491, is the principal statute conferring jurisdiction on this Court; however, Defendant denies that the Court has jurisdiction over plaintiff's claim for injunctive relief.

5. Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations contained in paragraph 5 of plaintiff's complaint.

6. Defendant is without knowledge or information sufficient to form a belief as to the truth or falsity of the allegations contained in paragraph 6 of plaintiff's complaint.

7. Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations contained in paragraph 7 of plaintiff's complaint.

8. Defendant admits the allegations contained in sentence one of paragraph 8 of plaintiff's complaint. In response to the allegations in the second sentence in paragraph 2, Defendant admits that the Corps owns Clearwater Lake and avers that it is the Reservoir

Control Branch of the Operations Division of the Array Corps of Engineers that is responsible for the regulation of Clearwater Lake.

9. Defendant admits the allegations contained in the first four sentences of paragraph 9 of plaintiff's complaint. Defendant is without knowledge or information sufficient to form a belief as to the truth or falsity of the allegations contained in sentence five of paragraph 9.

10. The allegations of paragraph 10 are conclusions of law to which no response is required.

11. Defendant admits the allegations of paragraph 11 of plaintiff's complaint.

12. In response to the allegations in the first sentence of paragraph 12, Defendant denies that the Water Control Plan was revised in 1995, but avers that Clearwater Lake Water Control Manual was revised in 1995. Defendant further avers that when the Clearwater Lake Water Control Manual was revised in 1995, the Water Control Plan included in the revised Manual was the original Water Control Plan for Clearwater Lake. Defendant admits the remaining factual allegations in the first sentence. Defendant does not have knowledge or information sufficient to form a belief as to the truth or falsity of the allegations contained in the second sentence of paragraph 12.

13. Defendant is without knowledge or information sufficient to form a belief as to the truth or falsity of the allegations contained in paragraph 13 of plaintiff's complaint.

14. Defendant is without knowledge or information sufficient to form a belief as to the truth or falsity of the allegations contained in the first sentence of paragraph 14, as Defendant does not know what Plaintiff means by "generally followed." Defendant denies that it stopped following the Water Control Plan in 1993. The allegations of the second, third, and fourth sentences of paragraph 14 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

15. In response to the allegations in paragraph 15, Defendant denies that there was an "unauthorized deviation from the Water Control Plan that began in 1993." To the extent other matters of fact are alleged, they are denied.

16. In response to the allegations in the first sentence of paragraph 16, Defendant denies that there was an "unauthorized deviation implemented by the Corps in 1993." Defendant is without knowledge or information sufficient to form a belief as to the truth or falsity of the remaining factual allegations in paragraph 16.

17. Defendant denies the allegations set forth in sentences one and two of paragraph 17 of plaintiff's complaint. In response to the allegations set forth in sentence three of paragraph 17, Defendant admits that the Corps sent a draft environmental assessment of proposed changes to the Water Control Plan to various state and federal agencies for comment in October 1999. The allegations in sentence four are conclusions of law to which no response is required. To the extent a response is required, Defendant denies the allegations.

18. Defendant admits the allegations contained in the first two sentences of paragraph 18. In response to the allegations in sentence three, Defendant admits that the United States Fish and Wildlife Service provided comments to the Corps, but denies that the United States Fish and Wildlife Service "concurred" with Plaintiff. In response to the allegations in sentence four, Defendant denies that any implemented deviations from the Water Control Plan were unauthorized and denies the allegations in sentence four with respect to the United States Fish and Wildlife Service. In response to the allegations in sentence five, the Defendant admits that the draft EA included a proposed FONSI, but avers that the proposed FONSI was included as part of the draft EA before any negative comments were received.

19. Defendant denies the allegations set forth in paragraph 19 of Plaintiff's Complaint and avers that the FONSI was never "issued." Further, Defendant avers that it received additional information from AGFC in January 2000.

20. Defendant admits the allegations set forth in sentence one of paragraph 20. In response to the allegations in sentence two of paragraph 20, Defendant admits that the proposed action, as described in the Final EA, was the implementation of an updated Clearwater Lake Water Control Plan; defendant denies the remaining allegations in sentence two of paragraph 20. Defendant admits the allegations set forth in sentence three of the Complaint. In response to the allegations in sentence four of paragraph 20, the Defendant avers the Final EA states that changes to the Clearwater Lake Water Control Plan proposed in the Final EA would have the potential, based on

information provided by AGFC, to result in 44.6 days during the growing season of a typical year having the potential for inundation, ponding, and/or bank overtopping; Defendant denies that the proposed Water Control Plan had been in place since 1993. In response to the allegations in sentence five of paragraph 20, Defendant avers that the Final EA states that, based on information provided by AGFC, the 44.6 day period represents a significant adverse impact to hardwoods growing in the Black River WMA, and extended inundation could result in adverse impacts to species composition and habitat deterioration; Defendant denies any remaining factual allegations in the fifth sentence of paragraph 20. Defendant admits the allegations set forth in sentence six of paragraph 20. Defendant denies the allegations set forth in sentence seven of paragraph 20 that the Corps "returned to the original (approved) Water Control Plan for Clearwater Lake" in 2000.

21. Defendant denies the allegations in sentence one of paragraph 21 of plaintiff's complaint. Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations contained in the remainder of paragraph 21 of plaintiff's complaint.

22. The allegations in paragraph 22 are a characterization of Plaintiff's Complaint to which no response is required. To the extent a response is required, Defendant denies the allegations.

COUNT I. Taking of Timber in Violation of Fifth Amendment

23. Defendant hereby repeats and incorporates herein its responses to paragraphs 1-23, above.

24. Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations contained in paragraph 24 of plaintiff's complaint.

25. Defendant denies the allegations set forth in paragraph 25 of plaintiff's complaint.

26. Defendant denies the allegations set forth in paragraph 26 of plaintiff's complaint.

27. The allegations of paragraph 27 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

28. The allegations of paragraph 28 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

29. The allegations of paragraph 29 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

Count II – Destruction of Soil Structure and Hydrology

30. Defendant hereby repeats and incorporates herein its responses to paragraphs 1 through 29, above.

31. Defendant is without knowledge or information sufficient to form a belief as to the truth of the allegations contained in paragraph 31 of plaintiff's complaint.

32. Defendant denies the allegations set forth in paragraph 32 of plaintiff's complaint.

33. The allegations in paragraph 33 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

34. The allegations in paragraph 34 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

35. The allegations in paragraph 35 are conclusions of law to which no response is required; to the extent matters of fact are alleged, they are denied.

Injunctive Relief

36. Defendant hereby repeats and incorporates herein its responses to paragraph 1 through 35, above.

37. Defendant denies the allegations set forth in paragraph 37 of plaintiff's complaint.

38. The allegations in paragraph 38 are a characterization of plaintiff's complaint to which no response is required; to the extent matters of fact are alleged, they are denied. In addition, the relief requested is outside the scope of the Court's jurisdiction. See Defendant's Motion to Partially Dismiss the Complaint (filed concurrently with the Answer).

WHEREFORE. The allegations in the WHEREFORE paragraph are a characterization of Plaintiff's Complaint to which no response is required.

To the extent a response is required, Defendant denies the allegations.

GENERAL DENIAL

All allegations of the Complaint which have not been specifically admitted, denied or otherwise answered are hereby denied.

FIRST AFFIRMATIVE DEFENSE

The Complaint fails to state a claim upon which relief can be granted.

SECOND AFFIRMATIVE DEFENSE

Some or all of the allegations in Plaintiff's Complaint are barred by the six-year statute of limitations. See 28 U.S.C. 2501.

THIRD AFFIRMATIVE DEFENSE

The allegations of Plaintiff's Complaint which sound in tort are beyond the jurisdiction of this Court.

FOURTH AFFIRMATIVE DEFENSE

Plaintiffs request for injunctive relief is beyond the jurisdiction of this Court. See Defendant's Motion to Partially Dismiss the Complaint (filed concurrently with the Answer).

FIFTH AFFIRMATIVE DEFENSE

Plaintiff is not entitled to the relief it seeks based on the doctrine of "relative benefits."

Dated: May 17, 2005

Respectfully Submitted,

KELLY A. JOHNSON
Acting Assistant Attorney General
Environment & Natural Resources Division

/s/_____
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[Certificate of Service omitted]

IN THE UNITED STATES COURT OF FEDERAL CLAIMS

No. 05-381L

[Filed September 21, 2005]

ARKANSAS GAME & FISH COMMISSION,	)
	)
Plaintiff,	)
	)
v.	)
	)
UNITED STATES,	)
	)
Defendant,	)
	)

ORDER

Pending before the Court is the plaintiff's motion for partial voluntary dismissal. The government's counsel has advised that she has no objection to this motion. Also pending before the court is the government's motion to dismiss that part of the complaint that requests injunctive relief. The two motions are interrelated because plaintiff now seeks voluntarily to dismiss the portions of the complaint that request such relief, even though it had previously opposed the government's motion partially to dismiss those portions.

A hearing was held on these matters on September 20, 2005, and at the hearing counsel for the parties advised that plaintiff's motion, if granted, would

render the government's motion moot. Accordingly, for good cause shown the court GRANTS plaintiff's motion for partial voluntary dismissal and DENIES as moot the government's motion partially to dismiss the complaint.

The parties have also proposed a discovery plan to the court and the court accepts that plan as reasonable. As a consequence, the court directs that factual discovery shall be completed by May 1, 2006, and the parties shall provide a joint status report on or before May 31, 2006, proposing a plan and schedule for further proceedings in the case.

It is so ORDERED.

/s/_____
Charles F. Lettow
Judge

**IN THE UNITED STATES
COURT OF FEDERAL CLAIMS**

Docket No.: 05-381L

[December 1, 2008]

ARKANSAS GAME AND FISH COMMISSION,

Plaintiff,

v.

UNITED STATES,

Defendant.

Courtroom 2C
Richard Sheppard Arnold
U.S. Courthouse
700 West Capitol Avenue
Little Rock, Arkansas
Monday,
December 1, 2008

The parties met, pursuant to notice of the Court, at 9:30 a.m.

BEFORE: HONORABLE CHARLES F. LETTOW
Judge

* * *

Trial Testimony of Robert Zachary

[Page 65]

staff on behalf of the Commission to request that the Corps of Engineers cease managing the water levels to Clearwater Lake in such a manner that was causing the flooding during the growing season.

Q As far as the condition of the management area timber, does your office or anyone else with the Game & Fish Commission maintain any records on the condition of the timber?

A Yes, there would be inventory data that was assembled and maintained by Mr. Hausman. There would be probably memoranda that he generated and there would be forestry compartment prescriptions that were prepared by Mr. Hausman which he would have maintained there in the regional office.

Q And I think you may have answered this but I want to be sure. Who with the Game & Fish Commission would know the most about the timber records that you just mentioned, inventories, prescriptions, memoranda?

A Well, that would be Mr. Hausman.

Q Mr. Zachary, you talked about Greentree Reservoirs called GTRs. Can you explain to the Court what is a Greentree Reservoir and specifically with respect to this management area?

A Yes, a Greentree Reservoir, it's a forested area that is artificially flooded seasonally, and for [page 66] the benefit of wintering waterfowl, and to provide recreational opportunity in the form of waterfowl hunting for sportsmen.

Q I think you testified earlier for this management area there is five GTRs, Upper and Lower Island, Upper and Lower Reyno, and the Winchester area. Is that correct?

A That's correct.

Q How often are these GTRs artificially flooded?

A They are flooded annually.

Q Could you tell the Court briefly how the Commission artificially floods these GTRs?

A Yes. We do have a system of water control structures, and the flooding process begins by closing the gates in the dam in Little River, at which point water will be diverted from the channel of Little River into the Upper Island GTR. The upper island, Lower Island will fill. There is a set of inverted syphons at two locations, carry water under the channel of Black River.

Once the Little River island compartments are flooded water is then diverted through the upper syphon into the Upper/Lower Reyno GTR. Once those areas have filled the water is diverted back under [page 67] Black River into the rest area of Winchester GTR through the lower syphon.

We do have a series of stop log structures and gated pipes that regulate water levels within the particular GTRs, and they are also used for discharging water from the management area when it's time to take the water off.

Q Now make sure I understand, what you just described is that the GTRs are flooded in a series beginning first with Upper Island GTR, and then Lower Island, and then you said water goes under through the syphons under the Black River, and it goes into the Reyno. Does it go into Upper Reyno GTR or Lower Reyno GTR?

A It will go right into the Lower Reyno GTR.

Q Okay. And then after that GTR is flooded, then the next GTR that's flooded would be the Winchester. Is that what you said?

A Correct.

Q Do you know typically when the Game & Fish Commission begins artificially flooding the GTRs on the WMA?

A Typically mid-October, around October 15th.

Q And how long do the GTRs remain artificially flooded?

[Page 68]

A Well, we typically begin attempting de-watering by the end of February, river levels permitting.

Q Okay. In other words, depending on the level in the rivers, and are you referring to what you said, Little River and Black River, are those the rivers?

A Those are the rivers. The water is discharged from the GTR system into the Black River. If the level of Black River is high or higher than approximately 4.5 feet, then we can't completely discharge water from the GTR.

Q And you explained that they're flooded in series. Are they drained in series or how do they drain?

A Well, they're drained by opening the water control structures. We do have the capability to drain them independently, but not necessarily flood them independently, but there are some gated pipes that we can open to drain the Little River island GTR, the structure that is left of Lake Ashbaugh on the crane move structures, the primary outlet for water in that part of the area.

Q Okay. You're saying Lake Ashbaugh is in the lower Little River area?

[Page 69]

A That's correct.

Q Where would be the structures for draining?

A It will be to the west and all the way in the left corner of the GTR. There is a stop log structure at that corner, and then there is a ditch that leads or channel leading from that stop log structure out to the Black River where the water is discharged.

Q Okay, and that drains, you said, into the Winchester GTR, correct?

A Correct.

Q Do you know in what year the Game & Fish Commission first began to artificially flood any of these GTRs on the management area?

A It's been approximately in the early 1960s. I'm aware that the first syphoning structure was constructed in 1961 as I recall, so it would have been along that period of time that we would have developed the capability to artificially flood the area.

Q Okay. So by my calculation we're talking about the agency has been doing this for what, over 45 years? Does that sound right?

A That would be correct.

Q I'd asked you earlier about telling us about the general condition of timber, overall condition of [Page 70] timber in the forested area on the Black River Wildlife Management Area. I want to ask you a similar question, Mr. Zachary, in reference to the timber in the GTRs, the five GTRs.

How would you describe the general condition of the timber growing in those GTRs when you became the regional supervisor in 1978?

A Oh, the general condition of the forest was great. There was no obvious problems with the forest health or condition by my observation, nor was there

any reports of that from our forester or later on by Mr. Hausman or any of our area managers.

Q Okay. And then with respect to the overall condition of the timber in those GTRs, did at any time the condition change noticeably during your tenure?

A If the question is at anytime during my tenure have the conditions in the GTR changed?

Q Changed noticeably. Yes, sir.

A Well, yes, in the late 1990s where we did have the event that was reported to us by Mr. Hausman. After the series of consecutive growing season flood years, there was the period where we saw the drastic change because of the loss of so many trees in the GTR and some other areas as well.

Q Okay. And I don't want to go back too much [Page 71] but one last question. You're saying the conditions changed in approximately 1999 in the GTRs with the timber. What would you describe the general condition of the timber that's in those five GTRs today?

A Well, comparatively, it would be in poor condition whereas a lot of the bottomland hardwood timber has died and has been replaced by wetland species such as buttonbush, other undesirable plant species.

Q Okay. We've talked about artificial flooding and now I want to talk to you about natural flooding. Does Mother Nature cause flooding naturally on the Dave Donaldson Black River WMA?

A Yes, on occasions. It's not uncommon.

Q What is the primary source of water that naturally floods onto the management area?

A The primary source is the Black River. There are some tributaries other than Black River that provide some local water, but the primary source is Black River.

Q Typically how often and when does natural flooding take place on the management area?

A Well, it occurs infrequently. Of course, in the spring months it's the rainy season, and that's the time we're most likely to receive heavy rainfall, [Page 72] and up until late winter/early spring is when we typically see natural flooding. But a rise in the river could occur any month of the year but normally that's of a much -- that's of a short duration if it's just a natural overflow.

Q You testified earlier about between 1993-1999 that there had been summertime flooding, and I think you testified about the Corps deviating from the water control plan, is that correct?

A That's correct.

Q Prior to 1993, can you say whether there was summertime natural flooding that occurred while you were the regional supervisor for the region?

A I'm sure that on occasion there was some summertime natural flooding.

Q Well, was there any difference before 1993 and after 1993?

A Not immediately after 1993. The difference after 1993 was that the natural -- the flooding wasn't natural. It was a controlled flood and the water stayed in the management area during the growing season whereas natural flooding would tend to -- you would see a sudden rise and then water would drain from the area as soon as the river went back down to within bank.

[Page 73]

Q Okay. So you're saying the flooding after 1993, the years that followed, you're saying that that wasn't natural, the water was staying on the area during the summer months, is that correct?

MR. BRYANT: Objection; leading, Your Honor.

THE COURT: Sustained.

BY MR. GOODHART:

Q Mr. Zachary, do you know at what level or what range of levels of water from the Black River generally result in flooding on the management area?

A Well, yes. Of course, the elevation of the area does vary from one end of the area to the other, and we know that the range would be, if we have a high river level you might see some drainage begin at around six feet in order to drain the lower parts of the area, and especially in the GTR areas. I'm talking about the Corning gauge reading. The river would have to be at

4.5 feet or less. At 4.5 feet or above water will begin to come into the area.

Q You answered my question, but you may have misunderstood me. You're saying that those are levels at which draining occurs. Now, if I put it to you the other way, at river levels in the Black River at which flooding begins on the management area, do you know the levels approximately when flooding starts?

[Page 74]

A At approximately 4.5 feet on the Corning gauge water will begin to come into the management area from the Black River.

Q And how do you know that?

A Well, I know that from my observations. I know that from my conversations with Mr. Hausman.

Q Okay. And you mentioned a water gauge at Corning. Do you know where water gauges are located along the Black River in the vicinity of this management area?

A Yes, sir. We have a water gauge, one in every GTR on the area as I previously mentioned, plus two additional gauges, and there will be one at Brookings and one at the Hubbell Bridge access.

Q You mentioned Brookings. What is Brookings?

A The Brookings access area.

Q Looking at the demonstrative exhibit, there is the name Brookings in Section 14.

A Yes.

Q Is there a structure located there?

A There is a water gauge located there at the boat ramp at the Brookings access.

Q And you mentioned another location --

THE COURT: Just a moment. I'm sorry to interrupt, Mr. Goodhart, but I'm trying to find this

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[Page 80]

Black River Water Control Plan is?

A The water control plan, that relates to Clearwater Lake. I'm aware that there is a plan. I'm not familiar with the details as far as dates and discharge rates and elevations. I couldn't be specific. But I do know that there is a plan and a protocol for releasing water to certain levels, certain river levels and gauge readings at various times of the year.

Q Okay. And do you know who administers that water control plan?

A It would be the Corps of Engineers.

Q Are you aware of whether the Corps of Engineers at some point in time was attempting to

make some permanent modifications to the Black River Water Control Plan?

A Yes, I'm aware that during the 1990s the Corps of Engineers was proposing to develop an alternate plan to my understanding would have benefitted some of the agricultural interests in the State of Missouri, and that would have been a deviation from the original authorized plan.

Q Have you ever had any discussions with anyone about the Corps of Engineers attempting to make changes to that Black River Water Control Plan?

[Page 81]

A Yes, I did. I did attend some meetings. There was a committee which was the White River Reauthorization Ad Hoc Work Group as I recall. I attended some meetings of that group, and then there was another spin-off of that group. This has been the Black River Subcommittee meeting, and there were discussions at some of those meetings about changes in regulating plans for the river.

Q You mentioned White River Ad Hoc Committee, and then you said Black River group or committee. Can you explain a little bit more about who was on that committee, what the differences were?

A Yes. There was several different interests. The Black River Ad Hoc Group, of course, the United States Fish and Wildlife Service, of course, had an interest in that, the Arkansas Game & Fish Commission. There were the agricultural interest especially along the low lying areas in Arkansas. There

were the agricultural interest in the State of Missouri. There was a recreational interest on Clearwater Lake that were represented at that meeting. Specifically, that would have been the owners of the boat docks and marinas and the operators of the camping area and recreation areas. There may have been some drainage districts or levy board members that also would have [Page 82] had an interest and been in attendance at those meetings.

Q Okay. But we've talked about there was two different committees, correct? White River committee and then a separate committee for Black River. Is that right?

A That's correct. The White River committee was concerned primarily with the bottomland hardwood forest on the White River National Wildlife Refuge, the Henry Gray Hurricane Lake Wildlife Management Area which were not in my particular area of responsibility at that time, but there were some concerns about growing season flooding on those two management areas as well. Our agency did have some comments and some input into the comments that were made at the White River Group.

The Black River Basin being a different situation was another interest altogether and concerned different group of concerned parties. Hence, there was a second committee, the Black River Ad Hoc Group.

Q Have any involvement, attend any meetings of those committees, either of those committees?

A Yes, I attended some of those meetings in Poplar Bluff, Missouri, there was at least one in [Page 83] Little Rock, and I believe at least one in Jonesboro.

Q What's the timeframe as to when these meetings were taking place?

A Oh, that would have been the mid-1990s.

Q Did the Corps of Engineers have any involvement with these committees?

A Yes, the Corps of Engineers did have representatives at the meetings.

Q Do you recall who was the principal representative for the Corps of Engineers on the White River Committee and the Black River Committee?

A I believe a gentleman named Mike Hendricks was their primary representative at the meetings that I attended.

Q Do you recall whether you had any discussions with Mr. Mike Hendricks about the committees and the water control plans for -- I think I've been referring to it as the Black River Water Control Plan, I think it's more appropriately called the Clearwater Lake Water Control Plan, but my question, did you have any discussions with Mr. Mike Hendricks who you said was the principal Corps representative?

A Yes, I did, and we, of course, expressed our concerns that the Dave Donaldson Black River Wildlife [Page 84] Management Area was experiencing flooding during the growing season, and expressed our concerns

that the deviations from the original authorized plan was the primary cause for that type flooding, and we requested some specific river levels as they would relate to the Corning gauge in consideration of the bottomland hardwood resources on Black River.

Q Do you know what the outcome was of the committee meetings for this Black River group?

A Well, we were never -- as a group never able to reach a consensus to an alternative plan that would be mutually acceptable to all parties. As far as the Game & Fish Commission is concerned, there was no proposed alternative that would have effectively eliminated the growing season flooding as the original authorized plan, but there was continued deviation from the authorized plan.

Q And you've testified these deviations from the authorized water control plan, they began around 1993, is that right?

A That's correct, and on up through the late 1990s.

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[Page 104]

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A I've seen the document previously, yes, sir.

MR. GOODHART: Your Honor, I'd move to have Plaintiff's Exhibit 2623 admitted.

MR. BRYANT: No objections, Your Honor.

THE COURT: We don't have a context for this, Mr. Goodhart. It will only take a few seconds.

BY MR. GOODHART:

Q Mr. Zachary, do you know who Mr. Armstrong was writing to? Do you know who this Gary Cristoff is?

A Mr. Cristoff served as moderator for the Black River Ad Hoc Subcommittee meeting on occasion. He does represent the Missouri Department of Conservation.

Q Did Mr. Cristoff attend any of the meetings of the Black River Subcommittee that you had testified to about earlier?

A As I recall, Mr. Cristoff moderated some of those meetings.

Q As you see the information in this letter that Mr. Armstrong was writing, is this information that you were privy to at the time this letter was written in 1996?

[Page 105]

A Yes. Mr. Armstrong is relating to Mr. Cristoff the concerns of the Arkansas Game & Fish Commission, and it's the deviations from the authorized plan of operation of Clearwater Lake was the direct cause of the growing season flooding and incurred damages on the Dave Donaldson Black River Wildlife Area.

Q We saw some earlier letters from Mr. Armstrong that had been copied to you. Do you know whether this was likely that Mr. Armstrong copied you on this letter?

A I think that it's likely that he did. I can't recall whether I saw this from another source or if Mr. Armstrong copied me directly.

MR. GOODHART: Your Honor, we would move to have Plaintiff's Exhibit No. 262 admitted.

MR. BRYANT: No objection, Your Honor.

THE COURT: Admitted.

(The document referred to, previously identified as Exhibit No. Plaintiff's Exhibit No. 262, was received in evidence.)

BY MR. GOODHART:

Q Do you know whether Mr. Cristoff had any [Page 106] concerns about the Corps of Engineers attempts to modify or deviate from the water control plan for Clearwater Lake?

MR. BRYANT: Objection; calls for speculation.

THE COURT: Rephrase.

BY MR. GOODHART:

Q Mr. Zachary, did you have any discussions with Mr. Gary Cristoff about the Corps' deviations from releases from releases from Clearwater Lake?

MR. BRYANT: Objection. It's going to be hearsay, the contents of those communications, Your Honor.

THE COURT: There's another way to put the question, that is, Mr. Zachary, in your work with Mr. Cristoff regarding the Black River Committee, did you gain an understanding of Mr. Cristoff's position regarding the Corps' interim plan.

BY MR. GOODHART:

Q Mr. Zachary, I'm going to make the Judge's question my question, and I'm going to ask for your --

A I'm sorry. I'm having a little more difficulty than I did before lunch in understanding your speech.

[Page 107]

BY MR. GOODHART:

Q In your interactions with the Black River Subcommittee, which I think you mentioned Mr. Gary Cristoff had attended some of those meetings, did you have an understanding about what his concerns were

with respect to the Corps' deviations from the Clearwater Lake Water Control Plan?

A My understanding was that he was as well concerned with the welfare of the bottomland hardwood forest along the basis were being affected by the growing season flooding.

* * *

[Page 175]

right?

A That is a possibility.

Q And if the contractors didn't follow the standards and archive that data, would they be removed?

A I seem to recall one incident where that was the case.

Q Where a contractor did not sufficiently archive his data so that it could be audited, is that correct?

A I'm not sure it was for insufficient archiving of data or insufficient collection of data that somehow didn't meet Mr. Hausman's standards, and it's my understanding that that individual was removed from the list of people that were allowed to bid on that work.

Q I'm going to turn back to the flooding. We talked about drainage at the six-foot level at Corning and you mentioned 4.5 feet. I think on your direct testimony

you also mentioned that flooding begins in some areas at 4.5 feet, is that correct?

A Yes.

Q And I think you said you base that on Lou Hausman's communications to you as well as your own personal observations, is that right?

[Page 176]

A It's based on information that's provided to me by area staff.

Q And I asked you a series of questions in terms of the information relating to drainage being whether data was collected and put into spreadsheets and the like, and you said that that was not the case for drainage.

Was that the case for flooding at 4.5 feet? Do you have any data spreadsheets, anything that you can point to that talks about that?

A By flooding do you mean natural flooding or are you referring to the work by artificial flooding? I'm not quite following you.

Q What did you mean when you said that at 4.5 feet at Corning you would begin to have flooding on the WMA? What did you mean by that?

A Well, I mean that when the Corning gauge has a level of 4.5 feet or more water begins to enter the wildlife management area at some of the lower elevations.

Q And where in particular are those lower elevations? Do you know?

A Not precisely, not all of them. The Winchester Rest Area impoundments will be some of the first ones to take on water, and there may be others [Page 177] that are sufficiently low to take on water about those same elevations.

Q And what are those areas?

A I said there may be others. I don't know.

Q You don't know. So the only one you do know about is the Winchester Rest Area, is that correct?

A Well, I am aware that at 4.5 feet or above then water will enter the area.

Q You're talking about the Winchester Rest Area, is that correct?

A Right, in that vicinity of the area.

Q And is that the entire Winchester Rest Area or some portion of the Winchester?

A I don't know. There is some difference in the gradient, and I'm not familiar enough with the gradient over that whole impoundment to tell you where water would be at 4.5 feet or at five feet.

Q Well, have you observed it at 4.5 feet there, in the Winchester Rest Area?

A Well, I've observed water in the Winchester Rest Area when I was aware we had about a 4.5-foot river level.

Q So you have observed water in the Winchester Rest Area when Corning has been at 4.5 feet. Is that what you're saying?

[Page 178]

A Yes.

Q And where was that? Where did you see that?

A Well, from the Winchester Road, from the levy. I've been in that area. In fact, made inspection trips in there on the levies. I've been in there on a four-wheeler.

Q And what were the dates that you observed those when Corning was at 4.5 feet?

A Well, I'm not sure what the precise level was, but I know that about 4.5 feet on that gauge the day that I was there. There was water in that part of the area on at least one occasion.

Q And how much of the area had water in it?

A I don't know. I didn't go over the whole area, but that's the part of the area generally that I was in.

Q But you haven't seen it elsewhere, the flooding elsewhere when Corning is at or about 4.5 feet on a WMA, is that correct?

A I haven't personally observed that that I can recall.

Q And you have not created any sort of documentation to record where you saw the inundation of water when the Corning level was about 4.5 feet in Winchester Rest Area, is that correct?

[Page 179]

A Well, again, when I'm there I'm there for various reasons, and I see things and I know things. But as far as the flooding of the area or the hydrology of the area, I'm dependent on Mr. Hausman and my area staff that have a whole lot more detailed knowledge of the management area to provide me information and to generate that kind of information than I am to write a report.

Q Okay. So you're primarily deferring to Mr. Hausman and others, not your own personal observations when you're opining about flooding at 4.5 feet, is that right? Is that correct?

A Yes.

Q Just to go back to my previous question, I don't think you answered it. You do not have any sort of journal or document recording something, spreadsheet that indicates where you've observed the flooding in Winchester Rest Area when the Corning level, as you said, was about 4.5 feet, is that right?

A I don't personally have that, no.

MR. BRYANT: No further questions, Your Honor.

THE COURT: The Court has a few, and I usually unless it's hyper technical wait until after both counsel have examined the witness, and I would

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Trial Testimony of Robert Leonard

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[Page 527]

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Q Next I want to show you what's been marked as Plaintiff's 32 and ask you to identify it. What's that document, Mr. Leonard?

A Appears to be the agenda for the meeting we just discussed. It's August 18, 1999, in Jonesboro. It's Clearwater Lake proposed release and impacts on the Black River and Riparian Wetland in Missouri and Arkansas. This is the agenda for the meeting we had.

Q When you say we had, were you in attendance at the meeting?

A Yes, I was. U.S. Fish & Wildlife would have -- do you need to know who was there?

Q Well, besides yourself do you recall who was there?

[Page 528]

A I can give you a general idea. There should have been a sign-up sheet, but in general it would have probably been Joe Kristofic, Mr. Rick Hansen, maybe Marge Harney from the U.S. Fish & Wildlife Service. And then it would have been me and Robert Zachary, probably Lou Hausman and others in his district. I'm not sure exactly. Like I said, there should be a list here.

Q Do you recall what was discussed at the meeting?

A I can go with the agenda here. We had the introduction and the brief history, and then state and federal involvement and the description of the releases proposed and the duration of these releases. This was all to get us on the same page as to what we felt like possible impact could be for the Fish & Wildlife Coordination Act.

MR. GOODHART: Your Honor, I move for admission of Plaintiff's 32.

MS. NICHOLAS: No objection.

THE COURT: Admitted.

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Trial Testimony of Martin Blaney

[Page 611]

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Q For those visits that have taken place since 1999 can you recall making any observations regarding the condition of the bottomland hardwood timber on the management area?

A The reason for my visit in 1999 was specifically to look at the forest conditions with Lou [Page 612] Hausman.

Q And what did you observe regarding the condition of the timber in that 1999 time period on that visit?

A We were experiencing a massive die-off of oak timber.

Q When you say massive die-off, can you describe the scale of acreage or parts of the management area that you're saying this took place on?

A Because of his familiarity with the WMA, I toured with Lou a lot of different areas of just severe damage in the vicinity of areas that we reported on. It was pretty devastating because of the pristine nature prior to my visit then all the way back to around the early 1990s. It was just such a stark contrast from the healthy forest that I'd seen before.

Q In other words, you've seen the forest, you said, on prior visits, and you're saying on those prior visits the condition was what?

A It was a healthy forest.

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[Page 613]

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Q Mr. Blaney, I was asking you about comparing your observations prior to 1999 when you visited the WMA with your observations on this visit that you were just testifying that took place with Mr. Lou Hausman some time in 1999. Can you tell the Court what the differences were?

A When I first visited Dave Donaldson Black River we would routinely get together with habitat managers and have planning meetings for establishing our habitat program protocols, and we would choose to visit different regions to host those meetings. So early in the 1990s, between 1990 and 1991, 1992 era, we had a foresters meeting there and we spent the whole day as foresters over on Dave Donaldson.

Lou took us from boat and it was the most beautiful intact bottomland hardwood forest that I've ever seen, and I've seen a lot of the Mississippi Delta, so it was absolutely stunning. All the trees were so large and healthy. The bowls didn't limb for (phonetic), I mean, there were just huge bowls. It [Page 614] was just a beautiful area.

I'd seen it in 1999 and see that the trees had just browned off, they had leafed out and just browned off. Everywhere we went that day was just such a stark contrast. I know Lou and I, it wasn't a very good day to be a forester.

Q But do you remember about when this was in 1999?

A Yeah. He called me around July 1999 and told me because it was pretty routine. If something major happens on any of the WMAs, that's when I get called because I'm the go-between between administration and making something happen. So it probably was early August.

Q When you said you saw trees that had browned out, were these trees either dead or in the stages of dying? Can you describe what the life of the trees were at that time?

A Well, they appeared dead.

Q And you said that Mr. Hausman had acted as a touring you on that visit. I'd asked you approximately what area of the management area you saw. Can you approximate what that may have been?

A Because I've only been there eight times I'm pretty reliant on Lou Hausman's understanding of the [Page 615] area, but I knew the names of different areas, I was somewhat familiar through the prescriptions and the management, so we had toured parts of Reyno, which is an impoundment, parts of Winchester and then we went around and saw Gar Slough area.

It was about maybe a day and a half, and I just, you know, I was all over the place but I'd have to rely on Lou on where all that was.

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[Page 620]

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Q I'm not asking you right now about what was in those reports. What I am asking you, though, is what you may have seen in reference, and you're talking about wetland vegetation, but your observations.

A I am. There was an abundance of button bush getting larger with each visit and a lot of vegetation through the open canopy. When it got light and it propagated it was very abundant in the understory. Also, I saw some of the lesser desirable species of [Page 621] trees, that would preclude oak, taking hold in the understory, things that are shade tolerant. Then they got established and then were being released, like green ash.

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Trial Testimony of Lou Hausman

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[Page 1165]

there for recreational purposes. About how frequently do you go there? Is that for hunting, or what do you go there for?

A I go there in the wintertime during the hunting seasons to bowhunt. I used to duck hunt a little. I don't do that much anymore. I like to trotline in the summertime.

Q Okay. So how frequently would you be on the management area for either hunting or fishing?

A Fishing? You know, we probably go once a week trotlining, maybe twice a week. Bow hunting? Every chance I get.

Q Can you generally describe the topography across the WMA and in particular changes in the elevation generally?

A Black River, it's all in a floodplain. You know, generally speaking the highest point is going to be the riverbank and the sloughs.

You know, through many years of evolution with the river rises and falling down a little bit of large particulate falls out and it kind of builds up the ground along the riverbanks . That's where the majority of the high ground tree species occur like willow oak, water oak, swamp chestnut oak, cherry bark oak. That's probably the highest gradients.

[Page 1166]

As you get away from the river and sloughs you start dropping in elevation, and then it gradually turns into a nuttall, overcup oak -- nuttall oak, overcup oak -- sweetgum which constitutes the majority of the area. The lowest gradient are usually tupelo, cypress areas.

Q You kind of got to my next question. I want to be sure I understand.

When you describe the elevation changes then that also affects the composition of the tree species?

A Yes. It can change, like I said, with a very gradual gradient, a change in the gradient. Sometimes a foot can mean a lot of difference in what species occur there.

Q What are the tree species that predominantly occur throughout the wildlife management area?

A It's primarily -- the majority is primarily nuttall/overcup oak. If you look at some prescriptions you can see from the inventories that it generally runs around 60 to 70 percent nuttall/overcup oak by either volume or basal area, number of trees.

Q Sixty to 70 percent nuttall. What about what percentage of overcup?

A Well, it varies. You know, the nuttall is going to dominate when they're together because it [Page 1167] just grows to be a little larger, but generally they coexist. It's probably a little heavier nuttall, but on the average 55/45 I guess to nuttall.

Q I want to make sure I understand you, though. You testified that across the management area nuttalls make up about 60 to 70 percent of inventory?

A The nuttall/overcup oak.

Q Okay. I'm sorry. You grouped those together. Okay.

Before the 2000 or 1999-2000 time period, do you know what the average ages of the nuttall oaks and the overcup oaks were on the WMA?

A I think they were -- I'll give you a range -- approximately 70 to 90 years in age.

Q What are the maximum ages for naturally grown nuttall oaks and overcup oaks as a forester?

A From what I understand, 130 -- 125 to 130 -- years is about the maximum age of a nuttall oak. I'm not so sure about overcup oak.

Q Generally what are the Game & Fish Commission's management objectives for this forest on the Dave Donaldson Black River Wildlife Management Area?

A When I first arrived, you know, I had to get together with the biologists. You know, I think we

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[Page 1188]

Q Okay. I don't want to go through a lot of this. Mr. Blaney has testified about timber sales. Are you involved directly in timber sales when they take place?

A I'm the contracting officer. I oversee to make sure they don't start before they're supposed to, you know, that they abide by the rules of the contract, that

they don't operate when the weather is not right, when it's too wet.

I make sure they cut the trees they're supposed to and not drag the logs too long. We don't want them dragging 60 foot long logs out there. We make them cut them up out in the woods so that when they snake them through the woods they don't scar the residual trees that's left. We're pretty careful on our logging operations.

Q There's been some mention in testimony about when the logging season is during the year. For this area of the state, what would be the logging season?

A Generally from July to August -- I mean July 1 to September 30 -- has always been our logging season. There's a few reasons for that.

On the back end, on September 30 that's generally the time when most hunting seasons -- you know, the bow hunting season starts or begins. You [Page 1189] know, we wouldn't necessarily have to quit then, but it is a wildlife area. You know, we want to serve the hunters as best we can.

But on the front end, that July 1 date is important because, generally speaking, by July 1 the area is usually dry. Not only as a gesture to duck hunters who walk around there in waders, you know, we're not going to allow any skidders to be out there when conditions are wet and they would rut it up.

You know, duck hunters would be falling off in them, and it's just not -- I mean, that's not a practice

we would allow anyway. It's not good management practice to leave ruts out there.

Q How would you describe the interest level from logging companies when the Commission advertises for bidding to sell its timber from this WMA?

A Well, really because they're so valuable only the larger hardwood mills in Arkansas are the only ones that bid on them. The interest is very high. It's very competitive.

Timber the size of what it is on the sales we have is very hard to find anymore. The quality is another thing because of the higher quality of the timber out there. They're able to cut a lot of grade lumber from it.

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[Page 1190]

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Q Were you on this area other times before then, or was that the first time?

A I believe that was the first time I've ever been there.

Q And then I guess you said that you've been on it quite a bit since 1984. Is that right?

A Yes.

Q Back at that time in the early 1980s, what was the general condition of the bottomland hardwood forest on the WMA?

A In the 1980s?

Q Yes, sir. When you saw it.

A Well, I was pretty amazed at the size. I [Page 1191] had never seen that much large nuttall oak in one location before.

I was impressed with how -- I mean, sometimes trained foresters, I guess they can look at trees and see it's growing pretty fast just by looking at the bark. It was good and healthy.

I knew it was going to be a fun job in a sense to manage that place. There was going to be a lot of interest from prospective bidders on timber sales. I knew it wouldn't be a chore. Sometimes on other areas it's a chore to get rid of timber sales. I knew it wouldn't be here.

Q What about other conditions of the forest like ground cover vegetation? What was that like when you saw it in 1980, 1984?

A There was no ground cover essentially. The only ground cover that you could observe would be like acorns that germinated. You know, they'd sprout or germinate and sprout and live off the acorn for probably a year and then die.

Q I'm going to ask you about changes observed in this forest, and I'm going to get to some of that, but

regarding the ground cover vegetation has that changed over time from your observation?

A Well, it's changed in some of the areas [Page 1192] we've treated, you know, with timber sales. You know, we have stimulated some ground cover, but in the areas affected from the deviations it has --

Well, I mean, the hydrology has really altered the whole ground cover environment. You know, what used to be or what could be I guess wildlife plants of desirable species is now covered with a lot of undesirable wetland species.

Q Okay. I'll probably come back to this, but the condition that you had observed when you first began working on this area and the condition currently. How would you describe that as far as the forest floor?

A It's changed drastically in the area that's been affected by inundation.

There's hardly any overstory left in some areas, you know, where the floodwaters stayed on it for consecutive summers in the '90s. A lot of buttonbush and smartweed, wetland plants, cardinal, cutgrass.

* * *

[Page 1226]

Q Can you explain the effects, as you would have observed them, of growing season flooding on the bottomland hardwood forest on this WMA versus the effects of artificial flooding on the WMA?

A Well, let's call it natural flooding, a flood that results from rain events. You know, they come down through the floodplain. They reach a peak level and start diminishing in a relatively short period of time.

Inundations like we experienced during the 1990s during the growing seasons, these were held at a constant level, and they were held on for long durations up until July and August.

You know, as the timeframe increased there through the growing season, you know, the oxygen or the water temperatures increased. The water temperatures increased, the oxygen in the water diminished, and it's my understanding when that happens that trees start becoming stressed.

A drastic change in hydrology like that also results in a drastic change of the ecology, the way those systems evolved and the way they respond to natural flooding as opposed to artificial growing season flooding. It's probably six years or something that those types have never experienced in their [Page 1227] thousands of years of evolution.

Q I'm going to ask you some more about the inundations through deviations time period that you were talking about during the summer, but as far as artificial flooding during the dormant season what about the effects on the hardwood forest from that?

A Well, there might be an effect over a long period of time in artificially flooded areas during the dormant season when all the trees are inactive. The temperatures are cold, and there's no transpiration or respiration taking place.

I think there's been some studies done that shows that over a long period of time, maybe 50 to 100 years, that there can be maybe a decrease in the reproduction or the quality.

Q What's your understanding of how long the green tree reservoirs on this WMA have been in existence?

A Since the early 1960s.

Q Do you know if they are flooded annually?

A Yes, they're flooded annually.

Q And to your knowledge, have they been flooded annually since their creation in the 1960s?

A I can only speak from when I started in 1983 to the present, the 25 years that I know of.

[Page 1228]

Q Okay. Do you know when during the calendar year the Game & Fish Commission artificially floods the GTRs?

A Well, they're artificially flood from mid October to the end of duck season generally.

Q And when is the end of duck season?

A Around the end of January. It varies, depending on how the U.S. Fish & Wildlife Service sets the seasons.

Q Do you know about the average depth of the artificial flooding in these green tree reservoir impoundments?

A Well, it would vary probably from a few inches to two and a half, maybe three feet.

Q After the Game & Fish Commission initiates the artificial flooding there sometime around you said the middle part of October, how long does it take generally to complete raising the level of water in the GTRs?

A It varies with the weather conditions. In a dry year it takes about six weeks and a wet year significantly less, maybe two or three weeks.

You know, if we got a flood the night before they'd be inundated in a few days. That's about all I can say about that.

[Page 1229]

Q Are you aware of any years when during the dry years that you're mentioning where the GTRs weren't flooded or weren't completely flooded?

A Oh, yes. Well sometimes we don't get completely flooded, you know, when duck season begins.

There's nothing written about that we have to have them like that, you know. It's really more beneficial for the waterfowl if you flood them at a slower rate.

Q Are you familiar with the water level measurements for the Black River that are available through the United States Geological Survey?

A Somewhat from 1980 to the present, I guess. I've studied those.

Q Do you know at what river stage locations are there water gauges on the Black River that you're familiar with?

A I'm familiar with the Poplar Bluff gauge, the Corning gauge. I'm familiar with our Hubbell Bridge gauge. I'm familiar with the Bookings gauge. That's the only ones I know about.

And the Pocahontas gauge, but it's not really -- it's below Black River, so it's not really a factor.

Q As far as you getting information about the [Page 1230] water levels, how do you get your information about water levels on the Black River?

A When I first started, the only source I had was the Jonesboro Sun. When we get it, they only publish the level of the day before. It was taken at a certain time during the day. I don't really know at what hour.

The river gauges are read hourly. So I couldn't really tell you what hourly reading they took and published in the paper, but that's where I got my information about the river level was basically at Corning, the Corning gauge.

Q Okay. You would normally get it from the newspaper. Is that where you currently get it from?

A No. With the advent of the internet, everything is available on-line. There's a website called the usgs.gov that shows you hourly elevations on the river.

Q Hourly at the gauge stations you mentioned, Poplar Bluff and Corning and Pocahontas?

A Yes.

Q If you had wanted to get gauge station information and not wait for it to come out of the newspaper, was there anyone else you could contact in order to get a water level measurement?

[Page 1231]

A Well, the Corps of Engineers. You could call them. Are you talking about in the early days, in the '80s?

Q I guess I'm talking now in the early days, yes.

A I mean, you could call the Corps of Engineers and they'd tell you what the level was, but the paper--

I don't know how it got relayed from the USGS to the Jonesboro Sun, but they seemed to be fairly accurate in the stages.

Q Okay. Besides the Hubbell Bridge and Brookings gauges that you mentioned, those were Game & Fish installed gauges, right?

A Right.

Q We heard from Mr. Martin Blaney, who testified in this case that he was involved in the installation of those. Were you also involved in that effort?

A Yes. I was there when both gauges were installed.

Q Are you familiar with any other water gauges or measurement devices that are on the wildlife management area?

A We have an MSL gauge in HGTR now, but that's [Page 1232] just been a recent occurrence. I believe they've been installed since 2004.

Q Okay. Besides the water level measurement information that I think you said you got out of the Jonesboro Sun newspaper and in more recent times off the internet that comes from the USGS gauges that we mentioned, have you ever obtained water level measurements either obtained by yourself or anyone else from these other particular gauges that you mentioned -- Hubbell Bridge, Brookings, the ones in the GTRs?

A Well, we would have obtained data from the Hubbell Bridge gauge. Clinton Hancock read the gauge daily from December of '94 through July of '95.

Q What was the reason for Mr. Clinton Hancock reading those gauges back then?

A We were just trying to get an idea of how the Poplar Bluff gauge correlated -- the Poplar Bluff and the Corning gauge correlated -- with the Hubbell Bridge gauge.

You know, we were just curious what the MSL would be at Hubbell when Corning was at a certain elevation or Poplar Bluff was at a certain elevation.

Q Okay. Besides your curiosity, would that help you in any way or tell you any information about [Page 1233] forestry on the wildlife management area?

A Well, when we had them surveyed in, I mean, I think there had been earlier testimony that we took elevation shots on red oak timber in the Rankins Creek area and also on the Brookings area.

Once we established at what levels those red oaks became inundated, we could backtrack it to the Corning gauge and to the Poplar Bluff gauge and make some correlations.

Q Okay. I'll ask you a little bit more about that, but right now you've been in the courtroom during the trial when the previous witnesses have testified.

You've heard some testimony about the Corps of Engineers' water control deviations for releases from Clearwater Lake Dam between 1993 and 2001. Is that right?

A That's correct.

Q Do you have personal knowledge of whether there was any summertime flooding on the wildlife management area during the period from approximately 1993 to 2001?

A Just from my own observations, you know, and using that Hubbell Bridge gauge and backtracking it to the upper gauges. It became pretty apparent to me [Page 1234] that releases from the lake were being constricted under this interim plan.

They were being so constricted that they were holding the river at an artificially high level during the growing season, causing inundation to a lot of our nuttall/overcup oak sites on the wildlife area.

Q During that time period from 1993 to 2001, can you recall specifically any of those summers where you made observations about what you were just saying, the flooding?

A Just '93 through '98. I believe '99 and 2000 were somewhat like drought years. We didn't really have any -- they didn't capture very much water in the lake, and they weren't forced into releasing part of it.

Q What about the period from '93 to '98? What do you recall observing?

A Just sustained, artificially high rivers on up into late July, especially '95, '96, '97.

You know, I think I've got water level data, and they clearly show it was late July before the river level at Corning ever fell below six feet.

Q You mentioned '95, '96, '97. Any other years where you observed summertime flooding?

A Well, 1998, you know, it was under about all [Page 1235] summer long. That was pretty drastic.

There was some local rainfall, but still yet they were -- as I've said before, one thing they were good at was holding that gauge at Poplar Bluff at six feet or at Corning too.

Even though there was a lot of local rainfall, the deviations were still going on and it prevented local rainfalls from doing what they normally do, you know, of spike and go back down. The river was still at a sustained level --

Q Okay.

A -- all summer long, even through August. All the way through August.

Q Okay. Back before 1993 had there ever been summer flooding events that affected the wildlife management area land?

A There was some flooding in 1985, but I wasn't really studying the river the way that I did or made those correlations before then. I just remember there was some summertime flooding in 1985.

Q As far as the previous flooding, how would that have compared as far as the river or, excuse me, the management area being able to drain versus this time period in '93 to '98?

A 1985?

[Page 1236]

Q Well, I'm just talking about in general. You can include 1985, but in general if there was heavy rains during the summer or other conditions how would the management area react under those conditions?

A Well, the drainage was just-- it's impossible to drain. We have a lot of low-lying areas that remain under water.

Q And when was that that you're saying it was impossible to drain?

A 1993 through 1998.

Q Okay. So would the duration of flooding before 1993 be relatively short? What would it be?

A It would emulate the natural flow of the river as closely as possible when they evacuated the waters as quickly out of the lake as possible using their authorized plan.

Q Okay. During that time period from 1993 to 1998, did the summertime flooding have any effect on the Commission's ability to do forestry work like timber inventories, timber markings for timber sale activities?

A It narrowed our time window, you know, on timber sales. We had about -- you know, once the river went down and we were able to evacuate the [Page 1237] water, drain the water out of the area, we might have had only about a month to complete a timber sale or work on it, and we might have to grant an extension.

Also, it inhibited our inventory and marking procedures too.

Q What kind of conditions in the forest itself, in the trees, were you able to observe during that time period from about 1993 to 1999?

A That were inundated?

Q Yes.

A Well, it seemed like it was mostly in the nuttall oak/overcup oak that were in the GTRs.

There were also two areas outside the GTRs at somewhat lower elevations. You know, the water would break over in time, and you wouldn't be able to drain it.

Q What were the conditions of the timber? What was that like during that time period?

A They were starting to show signs or exhibit signs of stress. The telltale signs for that is they're starting to lose a few leaves from the tips, from the ends of the twigs. That's just an indicator that a tree is under stress.

Q Okay. I guess that's what I was going to ask you.

[Page 1238]

I mean, if it's under stress you're saying the leaves, the tips. Any other visual signs that would indicate a tree was under some kind of stress?

A No. That's the main one.

Q Did you observe any other unusual conditions or changes in the forest during that time period?

A Just the difference in the change of the ground cover.

Through our management practice what we were trying to achieve was to stimulate some oak advanced regeneration to try to bring that about. Instead the sites were being occupied by buttonbush and other wetland invasive species.

Q I had asked you previously back when you first began in 1984 about conditions. For example, I think I asked you about like the stocking level of the forest.

During that time period from 1993 to 1999, what was the stocking level of the hardwood timber in the WMA compartments generally?

A In the GTRs? In the affected area?

Q Yes. During that time period, what generally was the stocking level in the compartments on the WMA? Was it relatively the same as before, or was it changed?

[Page 1239]

A It was relatively the same as the '80s, but I didn't know how long that was going to last.

Q During any time in the 1990s did you observe any evidence of ice storm damage in the WMA forest?

A Yes.

Q When would that have been?

A It was either December of '93 or January of '94. I can't recall exactly, but it was a pretty big ice storm. It broke off a lot of tree limbs and caused some access problems for a little while, but it wasn't nothing that we couldn't recover from.

Q Did you say access problems? Is that what you said?

A Well, mainly for waterfowl hunters. Yes. They like to drive their boats into places that they get close to the place they duck hunted.

It made some trees go down on the river or limbs down in the river that broke off.

Q I was going to ask you. I mean, were there a lot of trees killed from that ice storm event? What was your observation?

A There was no mortality from that. It might have created a lot of dents, but they quickly recovered.

In fact, we'll probably see some evidence [Page 1240] tomorrow. It's been a long time, but the limbs grew back out and releafed. It wasn't a significant event as far as creating any mortality on trees.

Q Okay. You heard Mr. Blaney testify yesterday.

He testified about a condition of the forest on the Dave Donaldson Black River Wildlife Management Area that underwent a major change, and I think he used the words a tree brown out to describe the occurrence. Do you know what he was referring to and recall that?

A Yes. That's something I observed around somewhere in July of 1999.

In just routine operations out on the area, I started noticing a lot of trees with brown leaves. You know, it wasn't long. I mean, we knew this was going to be or was a major occurrence, you know, just a tremendous change in what we had seen in years past. It looked like we were going to have a lot of dead trees on our hands.

Q Can you describe on what areas of the WMA you were seeing this and what was the scope of the areas?

A It was on all of the GTR impoundments, the Schaeffer's Eddy area and the Gar Slough area. You [Page 1241] know, the damage was -- I mean, once again this is not a flat surface. There are subtle differences in the elevation.

Most of the low areas that were maybe just low enough to be inundated during the growing season

were showing a lot of brown trees, a lot of brown leaf trees.

It was widespread. It was over most of the -- it was over practically all of the 7,000 acres that we've been testifying to.

Q I want to make sure I understand. Again, I'm no forester and don't have a forestry background.

What you're saying is in July of '99 these trees had already leafed out, and then they had brown leaves?

A Leafed out and died.

THE COURT: Mr. Shapiro?

MR. SHAPIRO: Objection. Leading.

THE COURT: Sustained.

BY MR. GOODHART:

Q Mr. Hausman, I'm trying to understand what this occurrence was like, and I need you to tell me a little bit further as to what you were observing during that time period that was different.

A What was different was, generally speaking, [Page 1242] on an acre of timber out in the woods there's about 50 trees per acre. If you can imagine, on two acres there's 100 trees.

If I could stand in one spot and look around and see 20 or 30 trees with brown leaves on them, you know, I think we have a problem.

Trial Testimony of Rick Watts

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[Page 1589]

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Q Would it be typical to see the undesirable [Page 1590] species that you -- let me back up. Can you describe some of the undesirable species that you observed on the WMA during your two site visits?

A Well, we had a herbaceous component primarily consisting of Smart Weed and Lizard's Tail that was in the wetter, lower areas, and it was basically devoid of any Arborescent tree-like species, one or two scattered here or there. You were starting to get the encroachment of the non-Arborescents, the Swamp Privet and primarily Button Bush, coming into the fringes, but it was starting to invade that area in some of the little higher elevations.

They were still low. You didn't see as much of the herbaceous component as you did -- I saw a lot of the non-Arborescents really taking over the understory and some of the Hackberry, Persimmon, Honey Locust, and more of the, you know -- they're native bottomland hardwood species but because of coming up under a dense overstory of Oak they had been suppressed. They were now up into the main canopy.

What had been a midcanopy was now the overstory, and what had been just a herbaceous or ground vegetation was now making up the midstory in the form of this brush. As you got to the higher elevations

you would see a few more of the Oaks. You [Page 1591] would see an occasional Red Oak, a Nuttall Oak. You'd see more of them where it was drier. You'd see White Oak.

There was a lot of White Oak acorns that were germinating, but I doubt they would ever come to fruition because of the overshading of all the undesirables that were shading out their development and because of the density of the population.

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Trial Testimony of Jim Foster

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[Page 2225]

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Q You may have said this, and I'm sorry -- I might have misunderstood. What about in the Part 1 study area? What were your observations in 2005 related to the areas that were surveyed or cruised by Kingwood in the Part 1 study in 2000?

A The 205 inspection confirmed the fact that there were extensive areas in the Part 1 study area that had reached a tipping point. In other words, the invasive, wetland, undesirable species had progressed to the point where they would inhibit, or even prevent, any color or any degree of natural regeneration of the desirable species.

For example, extensive areas had been occupied by buttonbush. In those areas, it's not possible for oak to naturally regenerate in the context of one or two generations. It would be a long, long process for that to rehabilitate naturally.

* * *

Trial Testimony of Dr. James Baker

[Page 2350]

notes to myself just as reminders of what I was seeing, just some observations that I was making. Sometimes I would just summarize my thoughts of what I was visualizing just for future reference.

We went to each of those units, and I have those designated Unit 1, 2, 3, and so forth, and I made notes on all of those. I made some general observations.

I also wanted to see some growing season precipitation data for the Pocahontas area, and Mr. Hausman provided me with some of that at his office, and rather than taking his copy, I think I just copied on one of these pages so I have some growing season precipitation for 1990 through 2000.

Just general information about the project, and this extended on in through 2005. I have information in here about our 2005 reevaluation and so forth. These are just my field notes. I relied upon these to develop my reports.

Q Why did you want to see precipitation data?

A Well, when we were up here in 2000, it was really dry. I had a soil push augur, we called it, that we could take soil samples. It's about four feet long. In some of these areas along these riverfronts, it was so dry I couldn't hardly get that augur in the [Page 2351] ground. It was almost like concrete.

It kind of surprised me because this area had been flooded for every year for five or six consecutive years, and now it was so hard and dry, I couldn't sample it. I wanted to see what some of the precipitation patterns, rainfall patterns, were. Of course, Lou Hausman said, Well, you know, we're kind of in a drought. It's really dry the last two years. In fact, it's been so dry that they haven't been able to hold much water behind Clearwater Lake; therefore, there hadn't been any really deviations in the releases. The river has been low.

But I wanted to see that, and I wanted to look at precipitation data, and this is that precipitation data that I copied. I wanted to see what the rainfall was. What it showed is that, in 1999 and 2000, we were in kind of a moderate drought. The annual precipitation was about 10 inches below normal both of those years, and most of that deviation was occurring during the growing season, the growing season months.

MS. GREATHOUSE: Your Honor, we would move for admission of Plaintiff's Exhibit 419.

MR. SHAPIRO: No objection.

THE COURT: Admitted.

[Page 2352]

(The document referred to, previously identified as Plaintiff's Exhibit No. 419, was received in evidence.)

BY MS. GREATHOUSE:

Q Dr. Baker, with regard to the first issue, Kingwood Forestry Services was asked to address, and that was whether there was excessive tree mortality and decline, were you able to arrive at an opinion on that issue?

A Yes, I was.

Q And without giving your opinion, can you describe the facts and data you relied upon to reach an opinion on that issue, and that being whether there was excessive mortality and decline on the WMA.

A Well, like I say, I spent four days up here looking at these stands, so a lot of it is just personal observation of a lot of mortality in these stands.

Also, I, later on, was able to compare the Kingwood inventory data for the affected area versus the control stands, and, of course, I had seen the control stands, and I didn't see any evidence of mortality in those stands, and the Kingwood cruise has basically verified that, very little mortality in the [Page 2353] control stands, but high levels of mortality in the other five areas that were inventoried. So it was basically from my observation and from some data that we collected.

Also, I asked Mr. Lou Hausman -- I was curious about, you know, what kind of mortality they had been having up here in the past, and I asked him did he have any recent inventories that Game and Fish might have conducted on the Wildlife Management Area, and he said that they did. I said, "Well, I would like to go to your Jonesboro office and look." He said they were in his files at Jonesboro.

So I spent about a half a day in Jonesboro, and he gave me some inventory records, tally sheets on two compartments that they had done within the last five or six years, I think, in the late eighties or early nineties. He carried me to a vacant office, and I sat there and actually counted and calculated mortality based on those tally sheets.

It was about what I kind of expected. It kind of, I guess, satisfied me that, okay, I know what kind of normal or natural mortality would be in these stands.

Q You mentioned that, in addition to your observations and looking at the Kingwood inventory [Page 2354] data and looking at the data provided by Lou Hausman in his Jonesboro office that you collected data. What data did you collect?

A When I was on the stands, I had a prism. Your Honor, I think we talked a little bit about prism cruises, and it's a variable-radius-plot cruise. It's a very easy way to collect some data quickly without having to spend a lot of time. But, anyway, I had a prism, and when we were going to these different areas, I would take prism plots, put in prism plots, you know, in different stand situations, and I could count the total number of trees and also the total number of

living trees and dead trees on a plot, and I was recording some of this, and I was kind of keeping up with, you know, well, this area has about 40 percent dead trees. I counted 10 trees, and four of them were dead.

So I kind of knew what that mortality was running, in many cases, and so when I got the Kingwood data, the tally sheets or the summary sheets from the Kingwood data, I kind of used it to verify what I was observing out there, but also I kind of used my notebook and what I had tallied to kind of check the Kingwood data, too, to see, yeah, you know, they are both in agreement with one another, so apparently both [Page 2355] estimates are pretty good.

Q In what locations on the WMA did you conduct your prism cruise?

A I did it on all seven areas: the three green tree reservoirs, two non-green tree reservoirs, and in the two control stands.

Q And how many prism plots -- is that the word you used? -- would you say?

A It kind of varied. What I was doing was looking for differences in stand types and changes in stand types or conditions across an area. We may be, like, on Mr. Hausman's four-wheeler, and I would be observing, and I would say, "Hey, there is a change there.

So when we got to that change in conditions, I would get Mr. Hausman to stop, and I would usually pace out a little ways and take a couple of prism plots

and see what the basal area was, see what percent of the trees were living or dead, and I would do that in various areas of the green tree reservoir, the non-green tree reservoir, and, I guess, in my mind, I was kind of stratifying those stands into different strata, and I wanted to take some measurements in each of those strata.

Q What strata were you using?

[Page 2356]

A A lot of it had to do with elevation changes, you know. The riverfronts are a little higher than some of the slack-water areas, and you also have a species change there associated with those changes in elevation. So I would maybe see a change in species composition. I would maybe see a change in mortality levels, that some areas had more dead trees than other areas, and so I would take the prism plots in those different strata, based primarily on elevation, drainage, timber types, and areas of mortality, or lack of mortality.

Q Changes in species composition are due to changes in elevation. Isn't that right?

A Yes.

Q How great of an elevation change on the WMA could result in a species composition change?

A Maybe three or four inches. You can have a four- or five-inch ridge in those bottom-land hardwood stands that would result in species composition changes because of drainage.

For example, Your Honor, when we went into the Schaeffer's Eddy area, when we got out of the vehicles and started to cross that stand, we were up on some high ground, and the species were primarily willow oak and water oak. It still had a lot of [Page 2357] leaves on, but as we walked to the south, I think that was, we were getting closer to the river, and the elevation dropped maybe four or five inches, and we started losing the willow oak and water oak and started picking up nutall oak and overcup and sweetgum, and as we progressed even further, you lost all of the willow oak, water oak, and you started losing your nutall oak, and it was going primarily to an overcup oak stand, and that's where all of that button bush was in many of the dead stands, was dead overcup oak that had died from the flooding.

I guess, for a layperson that's not used to that, that ground looks flat. It looks level, but there's elevation changes out there -- three, four, five, inches -- that make a world of difference in drainage and species composition.

Q Did you make your own calculations regarding the mortality, or did you just rely on Kingwood's information for the estimates of mortality that were observed in 2000?

A I think I tried to explain, I used both. I used my data to kind of verify their cruise, but I also relied upon their cruise as being a more accurate collection of data than my prism plot cruise.

So I used them in kind of combination with

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[Page 2385]

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Q You mentioned that you had also, as a part of what formed the basis for your opinion as to the cause of the mortality, you made observations about the trees. What observations did you make with regard to the trees, Dr. Baker, that formed the basis for your opinion?

A Well, I looked at dead trees, dying trees, and healthy trees and kind of drew a personal comparison. Many of the dead and dying trees had [Page 2386] evidence of heavy infestations of powder post beetles. These are very small beetles that usually attack a tree that's under severe stress or a tree that is dead or dying. They will not attack healthy, vigorous trees.

Many of the dead and dying trees had powder post beetles. You could see the frass all at the base of the tree.

Q And what do you mean by "frass"?

A It's the excrement from the beetles eating the wood.

Q Thank you.

A I also bored many of the trees with an increment bore and looked at two or three inches of the growth rings. What I was looking for there was some evidence of anaerobic activity going on in the cambium layer, and, in fact, I did observe that. It was kind of a

yellowing or darkening of the cambium layer on many of the, particularly, declining trees.

Some of the dead trees didn't show much evidence of that, but there was really no metabolic activity going on in those, but on those declining trees, you still had translocation of nutrients and water up and down the tree.

Also, those tree cores had a foul odor. You [Page 2387] know, it smelled like anaerobic activities going on inside that tree. I could smell, again, sulfur- and methane-type odors in association with those ring cores.

Q Do you mean by "anaerobic activity"?

A It's a chemical reaction that takes place in the lack of oxygen. It's a reduction reaction. I could go deeper into that, but I don't know if we have the time to do so.

Q You previously, in your testimony, this morning used the term "anaerobic conditions" and "anaerobic respiration," and now I've heard you say "anaerobic activities," so I'm trying to get a grasp of all of these anaerobic terms that you're using.

A Yes.

Q So can you just describe what this anaerobic condition or respiration is?

A Anaerobic respiration would be one form of an anaerobic condition or activity going on. I guess the

best way to explain it is, you know, respiration in a tree is just the reverse equation of photosynthesis.

Your Honor, you know a tree is able to extract carbon dioxide from the atmosphere in a little water and in the presence of chlorophyll in the leaves [Page 2388] and solar energy, and it can convert that carbon dioxide into carbohydrates or sugars. Those sugars have a lot of energy stored in them. It was solar energy converted to chemical energy, and that's photosynthesis. Of course, it releases oxygen. The tree releases oxygen.

Respiration is just that reverse chemical equation. It's where they take those sugars, they oxidize it in the presence of oxygen, converts it to carbon dioxide and water and releases about 36 units of ATP, a stored chemical energy, for each molecule of glucose that is oxidized.

Under anaerobic respiration, in the lack of oxygen, respiration still takes place, but the sugar is actually reduced. It's like making some good, fine wine or whatever. You end up with alcohol, usually ethanol, and a lot of byproducts, organic by products. Many of those byproducts are highly toxic to the fine root systems of a tree. These activities are taking place, by the way, primarily in the roots of the tree. That's where the carbohydrates are stored, in the root systems of the tree. There are some stored above ground, but the majority is in the root systems.

Some of those toxic chemicals that are produced in association with the anaerobic respiration [Page 2389] kill those fine tree roots, and so the tree root mass is drastically reduced over time. They can tolerate a year

of this, or maybe two years, in some cases, but they cannot tolerate successive years, four, five, six years, of anaerobic activity. These trees are just not adapted to that.

Now, wetland species, like buttonbush, lizard tail, and smartweed, they can operate under anaerobic conditions. They have special mechanisms, special metabolic pathways, that allow them to function under anaerobic conditions, but most bottom-land hardwood species that we have in these bottom-land hardwood ecosystems cannot do that.

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[Page 2392]

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Q Is there a certain time? You've mentioned saturated conditions. Is there a time of year that is more critical for soil saturation than other times of the year?

A Yes. You know, bottom-land hardwoods have developed under flooding regimes, but it's usually wintertime flooding, when the water is cold and wet, and well-oxygenated, and they can tolerate those kinds of conditions. They can grow in water, as long as it's oxygenated, and as long as you have low enough temperatures in the water, it's going to remain adequately oxygenated.

But in the summer months, particularly July, August, and September, when air temperatures reach 90 degrees or higher, the dissolved oxygen in the water

is going to escape into the atmosphere. The dissolved oxygen in those saturated soils is going to escape [Page2393] through the water into the atmosphere.

So the water and soil medium is going to lose its dissolved oxygen, and when it reaches a certain level, those trees switch to anaerobic respiration in order to survive, and the anaerobic respiration and the byproducts from that is basically what kills the trees. It's a combination of them losing their root system through the toxic substances, and also the lack of adequate energy production.

The ATP that's released when sugar is oxidized is required for other metabolic processes in the tree, like carrying on photosynthesis and transpiration and respiration and assimilation in growth. All of those processes require energy, and that energy is provided to a tree through chemical energy, ATP. It's denosene-triphosphate, by the way, sir.

Q How would you characterize the tolerance of a nutall oak to summertime flooding in that July-August-September time period that you've described?

A If the air temperatures reach 90 degrees for several days -- three, four, or five days -- the dissolved oxygen is going to be lost, and the nutall oak is very intolerant to those conditions, particularly over successive years. They can tolerate [Page 2394] it for maybe one growing season, but if you have three, four, five, or six growing seasons under those same conditions, it will finally kill the tree.

Q How about overcup oak?

A It's probably a little more tolerant than nutall. Overcup oak is more tolerant of wet -- those situations and probably a little more tolerant of anaerobic but not a whole lot more. They cannot tolerate four or five years of anaerobic conditions either.

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[Page 2399]

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Q Do you know what type of plant communities occupied the WMA prior to the deviation period that we've been talking about?

A They were fairly typical, what we would call "riverine, bottom-land, hardwood forest ecosystems" that had developed in a floodplain in association with a river.

Q How do you know what existed there prior to the deviation period?

A Well, you know, most of those nutall oak and overcup out there that we looked at were 70, 80, 90, 100 years' old, so they had been there for a while. Those trees and those types of stand conditions have probably been there for centuries.

Q How would you characterize the type of plant [Page 2400] communities that occupied the WMA in 2000?

A It was a bottom-land hardwood ecosystem in a state of collapse. Most of the nutall oak, most of the

red oaks were dead or dying. Many of the white oaks were dead or dying. Most of the sweetgum were dead or dying, and they were being replaced by wetland species in the understory -- buttonbush, smartweed, lizard tail, cyprus seedlings, black willow-- species that can tolerate a saturated soil condition throughout the year.

Q You described the pre-deviation communities as a "riverine, bottom-land hardwood community," I think, is the term you used. Is there a term for what you observed in 2000 that you've just described?

A I guess you would probably call it a "headwater swamp," a swamp condition.

Q And would you describe the 6,990 acres as a swamp?

A If that area had continued to be flooded, if they had not stopped flooding it in 1999, it would have turned into a swamp, yes, ma'am.

Q Prior to the course deviations, or the deviation period, was that 6,998-acre area a swamp?

A It was not a swamp; it was basically a bottom-land hardwood ecosystem, and within those types [Page 2401] of ecosystems, there are some swamp conditions. There are some old slough runs, slough beds, that are wet, and there's probably some very low depressional areas that may hold water a lot during the year, and they may be in a swamp condition, but they are usually, in terms of total acreage, fairly insignificant. The majority of that acreage is going to be in bottom-land hardwood stands.

* * *

[Page 2437]

* * *

So those things discounted for me the green tree reservoir management. The only other thing for me would be a major change in soil site conditions that would cause that type of mortality, and, based on those hydrographs, the river elevations during July and August and September that resulted in a major change in the hydrology of this bottom-land forest ecosystem, and that change in hydrology during those hot summer months caused some severe physiological problems for those trees, and it took several years for them to start dying, and they are that resilient. They were trying to recover their root systems, but they just could not keep up with the death of the root systems, and, after a period of four or five years, those trees started declining and dying.

I think that the summer drought in 1999 and 2000 was kind of the thing that tilted the scale. Those trees on these higher sites then that were not really deemed severely impacted by the summer flooding [Page 2438] early on because they didn't have as much water on them, the water was getting off quicker, it was probably moving a little faster, staying a little better oxygenated; they were still losing root mass.

When that drought hit in '99, and those huge nutall oak trees, something 36, 48 inches in diameter with crowns almost as big as this courtroom, but root systems not much larger than this desk, they could not support that crown, and that's why you had your

brownout. They would leaf out in the spring. They would do what they were supposed to do. They were supposed to leaf out, and then they would run out of water, they would run out of nutrients because those roots could not supply those big tops, and those leaves would brown out or die.

The trees were trying to stop transpiration from going on. They had to stop that transpiration, or they were going to basically starve themselves to death, so they browned out. Then they probably went on, many of them, and went into a state of decline, and then many of them died.

* * *

Denial of United States' Objections

[Page 2636]

MS. GREATHOUSE: Your Honor, I have no further questions for the witness. But I would renew my request for admission of several documents: PX-79, 80, 80A, 223, 504, and 505.

THE COURT: Mr. Shapiro, any re-cross?

MR. SHAPIRO: I have no re-cross.

THE COURT: Now, the Court has deferred action on the motion to admit PX-70, PX-80, PX-80A, PX-223, PX-504, and PX-505. Do you have a view as to admissibility, Mr. Shapiro?

MR. SHAPIRO: I do, Your Honor. We had opposed the introduction of these documents in

pretrial motions on two separate grounds, one being that we had not received certain underlying data that was necessary to fully understand these reports, the cruise maps and the cruise specifications being the most important.

The witnesses have testified that those cruise maps did exist; that they showed flat points indicating where the debt or the declining timber had been counted, and that those cruise maps could be used to locate those specific points on the WMA.

According to Rule 26, we believe that those cruise maps should have been retained and provided to the United States. In addition, we believe that those [Page 2637] cruise maps should have been retained, pursuant to the rules of the uniform appraisal standards, USPAPs, that Mr. Foster testified about.

And I would oppose in particular his appraisal report, on the basis that it does not comply with USPAP.

In addition, Your Honor, we made a motion, our pretrial motion involved a Rule 702 Daubert challenge. During the testimony the Court heard some significant confidence intervals discussion which was unrebutted by any of the witnesses. And although there was some discussion that perhaps the confidence interval would be narrowed, there was no discussion about what the new confidence intervals would be once the data was put together.

So the only error rate that is before the Court are the error rates that are in these documents, which approach, in some cases, 200-percent error rate. We

believe that, under the standards of Daubert, that the underlying data is not adequate to allow the introduction of these documents.

These were cruises that were done under some possibly written specification, cruise specifications, which we do not have, using cruise maps, which we do not have. All of the witnesses testified that they [Page 2638] were not aware that there was any auditing, and that there are extraordinarily high error rates.

So on those grounds, Your Honor, and the grounds we set forth in our pretrial motion, we would oppose the introduction of these documents.

THE COURT: Ms. Greathouse, briefly.

MS. GREATHOUSE: Yes, Your Honor. The testimony with regard to the cruise maps does not reflect what Mr. Shapiro has stated. And it's clear that the maps the United States wishes existed do not.

The witnesses testified that there were not, that every cruiser didn't record their plot location. And that even if they had, the maps that could have been created from those would not have been exact.

As for the motion with regard to the confidence intervals, there are various confidence intervals stated in some of the documents that we've looked at, that there are two things to focus on, the 200 percent.

We would submit, Your Honor, that the cruise method used is generally accepted, and, per the testimony, was applied reliably, and the results are therefore reliable.

THE COURT: The following exhibits are admitted: PX-79, PX-80, PX-80A, PX-223, PX-504, and [Page 2639] PX-505.

> (The documents referred to, having been previously marked for identification as Exhibit PX-79, PX-80, PX-80A, PX-223, PX-504, and PX-505, were received in evidence.)

THE COURT: I'm going to state briefly the grounds. The first ground, that is, that the cruise maps were not retained and the cruise specifications were not retained, is unavailing. These cruises were not done for litigation purposes; they were done respecting the Game and Fish Commission's management of the Dave Donaldson Wildlife Management Area.

Those cruise specifications, the ones that were used, were adequately disclosed, more than adequately disclosed actually, by the testimony of Mr. Livingston in particular, but also that of Mr. Foster. And those specifications were made readily available to the government throughout the course of this litigation. In fact, if the Court recalls correctly, Mr. Livingston had been deposed several times. I don't know how many times Mr. Foster was deposed. All that information was available to the government.

As to the cruise maps, as long as one knew [Page 2640] the direction of the cruise and the starting point, those results could have been generally replicated. And a deposition of either Mr. Livingston or Mr. Foster produced that information.

Mr. Livingston was quite explicit in which areas were cruised in which way, and there is just very little

question but that it was, developing a replicated cruise was quite possible.

And indeed, if an audit had been made, and it could have been made very easily, within a year or year and a half after the cruises were done, but these cruises were done well before this litigation was initiated. They were done in 2000 and 2001; this case wasn't filed until 2005.

Whether or not the Commission, or indeed Kingwood, chose to audit the results was entirely within their discretion. The government could have gone out and replicated those results as soon as the litigation was filed in 2005.

Now let's go to the question of the statistical error rates. They aren't error rates at all. They're a measure of the deviation or the statistical deviation around the mean, and that's all they are. And indeed, when you have a very small sample and a lot of variation in a very small sample, [Page 2641] you expect things like that. This Court has actually designed sample studies -- I mean, I did it years ago, I admit, not like this, for a completely different purpose, in products research.

It turns out that when you've got a sample population of relatively consistent or similar subjects, you can aggregate. And that's what, in effect, happened here.

Now, we do not have evidence of the results if you aggregate the similar samples. Just taking one stand is just not appropriate at all, and using that as a measure of the statistical deviation around the mean.

I'd have to go back to my old statistics text to get a more fuller explanation. And if you press the point, Mr. Shapiro, I will. But that whole line of questioning is completely unavailing.

Now, I think we have finished with Dr. Baker. Have we?

MS. GREATHOUSE: Yes, Your Honor.

THE COURT: Dr. Baker, I have enjoyed very much your testimony, and I've enjoyed learning a lot about these kinds of forests, and respect and value your knowledge. Thank you very much.

(Witness excused.)

* * *

Trial Testimony of Dr. Jerry Overton

[Page 2672]

figure.

A I used the Excel spreadsheet. I looked at ranges of gauge levels, beginning at five feet, five-two, six, and so forth; greater than 11.5 feet. I calculated, based on months, as well as the totals, the average number of days that the wildlife management area flooded given the five-foot-level stage.

Q Those were comparing the two time periods we just discussed.

A Yes, sir.

Q Okay. And the second time period of figure 4, showing 1993 through 1999, is the period in which the deviations are being utilized by the Corps. Is that correct?

A (No audible response.)

Q Now, from your work in this case, do you have an understanding of the growing season for the hardwood timber located in the WMA?

A I have a much better understanding now than I did in 2001, after sitting through this week and a half of trial.

Q And what is that growing season?

A From approximately mid-March to approximately mid-October.

[Page 2673]

Q Also from your work in this case, do you understand that there may be some critical months of that growing season?

A Yes. I've heard various testimony and discussed this with a number of foresters. And although they don't all agree, it's generally from June through early September.

Q And in looking at figures 3 and 4, what does the data show, in your opinion, as to any differences in the two time periods for the average number of days that the gauge at Corning was above five feet?

A Mine is very difficult to read, but across the bottom I do have the totals handwritten in there. But if you compare the two graphs, there are more days of flooding for the 1993, on average, than for the 1993 to '99 than for the 1981 through 1992.

Q And does that also apply to the critical months of the growing season?

A Yes, especially for June and July.

Q Now, in addition to looking at the average number of days, did you look at the average percentage of each month that the Corning gauge was at five feet or above for these two respective time periods?

A Yes, I did. I took each of these totals at the bottom, and found out what percentage that use of [Page 2674] the respective month that they represent, and came up with totals there, and I came up with totals there. They are not shown on my copy here, but I did do that.

Q Do you have that information?

A Not here with me on the stand.

Q What are the results of that in comparing the two different time periods?

A Again, the preponderance is a higher percentage for the 1993 to 1999 period than for the 1981 to 1992 period, especially for the critical growing months of June and July.

Q Okay. And the higher percentages were during 1993 to 1999?

A Yes.

Q Now, did you look at any precipitation data? When we're talking about these correlation or relationship of these gauges.

A Yes. When we looked at the stage data, one of the things we did was to pull the precipitation data for the Corning station, and take a look at that. And we also looked at Poplar Bluff station area, looked at that area. And actually I found that there was virtually no difference between the two time periods for either of the two stations.

Q 1982 to 1993, and then the 1993 to 1999?

[Page 2675]

A Yes, sir.

Q You're saying you found no significant difference in those two time periods?

A I didn't do a statistical analysis, so I will not use the term "significant" either in deposition or in trial. But I didn't find any difference that I thought was of concern.

Q In terms of an amount of precipitation.

A Yes.

Q Now, before we started we were mentioning to the Judge the supermodel issue we have in this case. And I want to ask you a little bit about that.

You reviewed the testimony and opinions of Dr. Nutter, I believe.

A Yes, I did.

Q Regarding the supermodel projections or simulations in this case.

A Yes.

Q And do you agree with his conclusions he drew in his depositions about those?

A No, I do not.

Q And did you review the data he utilized?

A Yes, I did.

Q And did you prepare any type of table or form utilizing this data?

[Page 2676]

A Yes.

MR. MORGAN: May I approach, Your Honor?

THE COURT: Yes.

BY MR. MORGAN:

Q I'm going to show you what we have marked as Plaintiff's Exhibit 492 and ask if you can identify this document.

(The document referred to was marked for identification as Exhibit PX-492.)

A Yes. This is a very lengthy table. I think it's approximately, it is 50 pages in length, that summarizes the data that I looked at from, provided by the defense.

Q Explain to the Court what you've done in this table.

A Okay. There are six columns in this table. The first column, starting on the left side, are the dates from January 1, 1993, through December 31, 2000, the last date.

The second column is the USGS data for Corning gauge that was provided in this case by the Defendants.

The third column is the supermodel simulated data that was used by Dr. Nutter. The third column [Page 2677] are the deviations, and you'll have to go down a couple pages to find the first deviation. Page 4, I believe.

Q Page 4?

A Yes, page 4 would be the first deviation shown here. And it was marked, I just used an X to indicate that for that date, corresponding date was a deviation.

The next column, the fifth column, is the Corning gauge data, marked with an X also, to indicate that it was at five foot or above for the corresponding dates.

And then the final column is the simulated supermodel data that represents the same thing. That is, to represent five foot or above for the Corning gauge.

Q Let's go to, if I can, on page 4 of 50 of Plaintiff's Exhibit 491. I believe, let's look at July 5 of '93 and July 6 of '93.

A Okay. July 5 of '93 we were under a deviation. It started on July 1, and went through July 5.

If you looked at the Corning gauge data, on July 5 we did have an elevation above five feet at the Corning gauge. The supermodel simulated data [Page 2678] indicates that there should not have been an elevation of five feet or more.

Q So on July 5 of '93, the supermodel simulation said the Corning gauge should not be at five feet; but in actuality it was, based on the actual gauge reading?

A Right.

MR. SHAPIRO: Objection. Leading.

THE COURT: That's apparent from the data. That question is allowed.

THE WITNESS: Yes, that's correct.

MR. MORGAN: Thank you, Your Honor.

BY MR. MORGAN:

Q Now, it's a 50-page document. And did you actually prepare an additional table that in your opinion summarizes the data shown in Plaintiff's Exhibit 491.

A Yes, I did.

MR. MORGAN: 492, I believe, Your Honor. I'm sorry, I misspoke. May I approach, Your Honor?

THE COURT: May I ask a question? I'm sorry to do this, too.

Dr. Overton, how do you define deviations? Because to the Court's eye, there are deviations on the first page, not just the fourth.

[Page 2679]

THE WITNESS: Well, the first deviation is from July 1 through July 5. And it's marked, indicated by an X in the deviation column to correspond with those dates.

THE COURT: Why, for example, is there no also a deviation, say, on February 10 and 11 of 1993?

THE WITNESS: According to Dr. Nutter's report, unless I just missed one, there was no deviation at that time.

THE COURT: Then I'm missing something. I just don't understand how deviation is defined.

THE WITNESS: Well, deviation, deviation is the time periods which the Corps of Engineers requested and received, someone requested and received permission to deviate from --

THE COURT: It's not a deviation from the readings at Corning --

THE WITNESS: Oh, no, sir.

THE COURT: -- the actual readings and the projected readings. It's the deviation in the water flow or release from Clearwater Lake.

THE WITNESS: Yes, sir. And these are provided in Dr. Nutter's report.

THE COURT: All right, thank you.

MR. MORGAN: Your Honor, I would like to [Page 2680] clear up one thing. If I referred to Plaintiff's Exhibit 492 as 491 before in this line of questioning, I want the record to be clear that I was referring to 492.

THE COURT: All right.

BY MR. MORGAN:

Q Okay. Now, let me show you what's been marked as Plaintiff's Exhibit 491.

(The document referred to was marked for identification as Exhibit PX-491.)

A Yes. These are three pages that, each in their different ways, summarize the data that was provided in Exhibit 492.

Q Explain to the Court, please, what this summary table shows, please. Plaintiff's Exhibit 491.

A Yes, the first page. This is a summation of the Corning gauge flooding days, as a result of the deviations, as derived from the Exhibit 492. It's by year, which would be the columns, and by months, which would be the rows. And the rows are summarized on the right-hand side under "totals" for each of the months.

And at the bottom of that total is total number of days of flooding, directly a result of the deviation, based on the difference between the [Page 2681] simulated data and the actually observed data. The total is 181 days. That is throughout the year.

Below that you'll see a number that corresponds to the growing period, the growing season of 156 days of flooding.

Q Those were days the supermodel would have simulated that there would not have been a Corning gauge reading of five foot?

A Yes, sir.

Q And according to the actual gauge, it wasn't five foot or above?

A Yes, sir, as a result of the deviation only.

Q Going to back just a second to the information I asked you from Dr. Nutter's report about the pressure transducers he utilized?

A Yes, sir.

Q And again, that dealt with -- what did those show, in your opinion?

A Each of his graphs showed, there were actually two graphs overlaid one on the other. One graph showed the Corning gauge stages, the other graph showed the pressure transducer levels in elevation. And he also provided on that graph a straight line across the center of it that -- not across the center, but across the graph -- that showed the elevation of [Page 2682] the ground surface.

And the conclusions you drew from that were what, now?

A That if you look at the point at which the pressure transducer shows that the water is no longer on the surface on that date, you can go to the same date for the Corning gauge and see what the Corning gauge stage was. In every case, it was below five.

Q Okay, all right. Now, one last question. The Plaintiff's Exhibit 491 we were looking at, I want to make sure I understand.

Dr. Nutter's analysis of that supermodel simulation, did it over-estimate or under-estimate the

number of days that the Corning gauge would have been up about five feet?

A It under-estimated, based on this information.

Q That's contained in Exhibit 491.

A 492 and 491 combined.

MR. MORGAN: Okay. I pass the witness, Your Honor.

THE COURT: Yes.

CROSS-EXAMINATION

BY MR. SHAPIRO:

Q Mr. Overton, let's look at JX-20 if we

* * *

[Page 2688]

this in my deposition. It was either right before or right after I was supposed to be deposed the first time.

Q And you were somewhat surprised to learn that Arkansas Game and Fish had installed these staff gauges on the WMA.

A Yes, I was.

Q On the same page, what you're recommending here with regard to the installation of the staff gauges is that they be installed at various locations. And that

is because the WMA is not a homogeneous elevation or a homogeneous area, is that right?

A Yes, sir. It's a very heterogeneous area.

Q Right. So you'd need to have staff gauges at various elevations?

A Not just at various elevations, but in different portions of the refuge, or wildlife management area.

Q In order to get a representative sampling of gauge readings.

A Yes, sir. And then at different elevations also within those areas, perhaps.

Q You recommended, in addition to the installation of the staff gauges, that Arkansas Game and Fish Commission install video cameras next to

* * *

[Page 2698]

So you're looking at a certain number of years between '83 and '92, I think that's 10 years if my count is correct. And '93 to '99, that's seven years.

A Yes.

Q That could also be an explanation of why there's a differential in your data.

A No, it couldn't. Because we're running a correlation regression here, which should average out, regardless of the length of the two time periods.

Q You also testified, Dr. Overton, about the correlation between a Corning gauge and the WMA flooding.

A Yes. Not a correlation, a relationship.

Q A relationship, thank you. And you stated that you were told by someone with Arkansas Game and Fish Commission what the Corning stage level was, at which point the Black River begins to inundate trees on the WMA?

A I was told that a conservative number would be five foot.

Q And Mr. Hausman told you that?

A As I testified in my deposition, I had discussed with Mr. Goodhart, Ms. Hausman, and Mr. Blaney this information. And one of those, or maybe several of those, gave me that information.

[Page 2699]

I do not remember, in 2001, which one actually gave me that. It could have been Lou Hausman.

Q Did you write it down or take notes during that conversation?

A I'm sure I did, but I don't have those notes now.

Q Okay. Would you have just gotten rid of those notes?

A Four years ago we moved our offices, and a number of documents were lost. Unfortunately, some of my early notes and so forth for this case was lost in the move. I don't know where they are.

Q Okay. And as you sit here now, you can't recall who actually gave you this information about five feet at Corning?

A It was either one or several of those people.

Q You don't know, or you did not independently verify what you were told.

A No, I did not.

Q You don't know how whoever told you that had reached that conclusion.

A No, I did not.

Q You don't know what period of time whoever [Page 2700] told you that may have evaluated the situation on the WMA.

A At that time, I did not.

Q You don't know what data may have been gathered before that information was given to you.

A At that time, I did not.

Q You don't know how many data points they used.

A At that time, I did not.

Q And in fact, you've never seen anything in writing which was generated by Mr. Hausman or any of the other Arkansas Game and Fish Commission individuals that might support that statement?

A No, I did not.

Q You compared 1981 to 1992 information to 1993 to 2000. And you discussed that?

A Yes.

Q Turn to table 1 of PX-506.

A Okay.

Q And this includes table 1 and table 2?

A Yes, both the same page.

Q All right. You considered 1981 to 1992 to be sort of a representative set of years of non-deviation period?

A That was the data that I was provided with.

[Page 2701]

Q And you considered that to be representative of sort of non-deviation years?

A Yes.

Q And what is included in here is a comparison of those two datasets.

A Yes.

Q Now, from 1993 to 1999, I'm assuming you did not include data from 2000.

A No, I didn't have that data in November 1999.

Q But your final report was written after the year 2000.

A Yes.

Q So you could have gone back and -- what you're saying is that you just took the information that you had put together in your draft report and copied that into this final report.

A Yes.

Q Your draft report was completed before 2000 data was in. That's why that information was not in there.

A Well, yes, that's right.

Q And then when you completed your final report, that information was there, but you just did not update this table.

* * *

[Page 2723]

A Yes.

Q Mr. Hausman was able to take GPS measurements locating the specific place where Dr. Nutter was placing those devices?

A Yes, sir.

Q And you accompanied Dr. Nutter when he went back to the WMA to collect that data.

A Yes.

Q And you accompanied him again for a third visit when he removed those devices.

A Yes.

Q And I was with you on that trip, is that right?

A Yes, you were.

Q And Mr. Hausman was also there?

A Yes. There was also a fourth time.

Q Did you ever tell Dr. Nutter when he was installing the water level controllers that you're putting these in the wrong place?

A No.

Q Let's look at PX-492, which is your summary of some of the information about the supermodel. Do you have that in front of you?

A Yes.

Q I'd like you to look at page 11608.

[Page 2724]

A Okay.

Q On that page, you testified about the meaning of what some of the Xs mean in the last three columns?

A Yes, sir.

Q Now, if you look at the supermodel above five feet, that would represent a day where the supermodel was above five feet, according to the supermodel data.

A Yes.

Q Okay. Now, there are a couple of days here where the supermodel was predicting above five feet, but the actual Corning gauge was below five feet.

A Yes, sir.

Q And on this page, there are three instances of that. Or, yes, three instances. Is that --

A Yes.

Q Are there other instances of that throughout this data?

A Yes.

Q Did you take that into account when you summarized this information in the spreadsheet that we looked at, PX-491?

A Yes.

Q You subtracted off those.

[Page 2725]

A No. You should not subtract them.

Q Why is that?

A Because what this shows is that the simulated data shows certain days that should, that it's predicted to be flooded. And we have the real data in relation to the deviation.

The difference between the point at which the simulated data ends and the actual data continues in relation to the simulated data, in relation to the deviations, is really what we're looking for. That's the days that the deviation caused the, the water level to the above point at which the flow would be into the refuge.

Q And if the deviations resulted in, in this case maybe up to three days less time when Corning was over five, that was just not part of your analysis.

A Well, you would not subtract that. That would be ridiculous.

Q Okay. Let's --

THE COURT: What was your question again, Mr. Shapiro? I didn't understand it at all.

MR. SHAPIRO: I'm sorry. The supermodel, I believe my question was that Dr. Overton did not account for the fact that the supermodel was simulating three days above five feet, while the [Page 2726] actual Corning reading was below five feet.

THE COURT: That's what I didn't understand. What is the significance of the supermodel simulation?

BY MR. SHAPIRO:

Q Well, wouldn't the supermodel be somewhat representative, or attempt to simulate the river stages, had the Corps not deviated?

A That's the assumption, yes.

Q So in this instance it's suggested that there are at least three days here where, had the Corps not deviated, the supermodel would say the river level would be higher than it actually was.

A The supermodel would predict it would be higher. But you wouldn't subtract those dates. You'd subtract the dates beyond where the supermodel ends and the actual data continues as a result of the deviation. You would not subtract those other days.

THE COURT: Mr. Shapiro, I think my understanding -- I just don't understand the supermodel. I thought the supermodel took the releases from the lake, and modeled the results afterward. And it didn't make any difference whether it was the deviation period or not.

MR. SHAPIRO: Well, I'm glad the Court is asking that question.

[Page 2727]

BY MR. SHAPIRO:

Q Is that your understanding of what the supermodel was simulating? Let me rephrase it.

Is it your understanding that the supermodel simulates what the river level would have been, had the Corps not deviated?

A Yes. It's a simulation.

Q So the actual Corning gauge above five feet is what was actually measured on the ground. And then the supermodel above five feet is what the supermodel was simulating would have happened had the Corps not deviated, is that right?

A Right.

Q On PX-491 --

THE COURT: That doesn't square with the Court's understanding from the in limines, I'll just tell you that, Mr. Shapiro.

MR. SHAPIRO: I'll be glad to respond if the Court has additional questions.

THE COURT: Well, it's not appropriate with Dr. Overton, because he never looked at the assumptions built into the supermodel.

MR. SHAPIRO: If the Court wanted to take a break, we could certainly discuss this.

THE COURT: Well, I thought the supermodel, [Page 2728] though, was just a simulation of what the flows -- well, the deviations only occur from what period to what period?

MR. SHAPIRO: Your Honor, from 1993 --

THE COURT: Oh, no. I'm talking about the days or periods during the year.

MR. SHAPIRO: The Court will see that evidence with Dr. Nutter's report. It was not consistent among the years. So there were some years where the deviation occurred for a couple of days, and I think you're seeing that in PX-492, in 1993. There were other times where the deviation lasted much longer.

THE COURT: All right. My point is, I guess, I'm looking at 492, there's no deviation during the first, and at least in 1993 during the period up to and including June 30, 1993. That's the Court's understanding from Dr. Overton's exhibit here.

So you'd have to then look at the correlation, whether the supermodel actually is correlated to the actual data. And I'm looking at January, February,

March, April, and I'm trying to find how well the model actually correlates to the actual results.

MR. SHAPIRO: Right. And the Court will [Page 2729] see, with Dr. Nutter's report, particularly with regard to 1999 and 2000, the drought years, that there is a significant correlation between what the supermodel is predicting -- or, not predicting -- what the supermodel is simulating and what actually occurred.

THE COURT: I just was looking at the first three or four months of the year. I didn't find a very good correlation at all.

MR. SHAPIRO: Well, the Court will see all of these years graphed in a visual form. And you'll be able to see how well it correlates.

THE COURT: That helps. That's part of the problem in taking Dr. Overton's testimony regarding the supermodel, when we don't have the base information about the model.

MR. SHAPIRO: That's right.

BY MR. SHAPIRO:

Q The discussion that the Judge and I just had about the supermodel, is that consistent with your understanding?

A As well as I followed it, yes.

Q Okay.

A You know, the problem with the supermodel is we don't know what the assumptions are. We know [Page 2730] nothing about how the supermodel was run. All we were given was the end data.

The Corps has refused to give us that information, I understand. I tried to get it. I believe the Plaintiffs have tried to get it. And for some reason, the Corps does not want to give it to us.

So I don't know what went into the supermodel. All I know is it's a simulation. It's not reality, it's a simulation of reality.

Q But you got the supermodel data that's used in Dr. Nutter's report in approximately November of 2007, over a year ago.

A That sounds about right.

Q Did you suggest to Plaintiff's counsel that you needed to know further information about how the supermodel works?

A Yes.

Q And did you, are you aware of any letter or request to gather that information that was made to the United States?

A I don't know what they did. They said they couldn't get it. I tried to get it personally, and I could not get it.

Q But you didn't contact me or anything to try to get this information.

[Page 2731]

A It's not my position to contact you.

Q All right.

MR. GOODHART: Your Honor.

THE COURT: Mr. Goodhart.

MR. GOODHART: I don't think the questions are appropriate to this witness. We can take that up with the motions. But there definitely are written requests to counsel regarding this very subject.

THE COURT: Well, actually, the questions that Mr. Shapiro has posed that Dr. Overton has answered help illuminate that problem. I think each is being direct about it, and it's actually helpful.

MR. GOODHART: I withdraw any objection.

THE COURT: No, no, that's just a problem. Mr. Shapiro.

BY MR. SHAPIRO:

MR. SHAPIRO: Q Let's look at PX-491, please. Now, this summarizes the information that we looked at with regard to PX-492?

A Yes, it does.

Q What is colored in green here March through October? Is that intended to represent the growing season?

A Yes, it is.

Q So here you've included March as part of the [Page 2732] growing season.

A Yes, that's my understanding of the growing season, mid-March to mid-October, as I testified earlier.

Q All right. Now, in October, it's your understanding, is it not, that the Greentree Reservoirs are intentionally flooded for at least part of October.

A Yes.

Q Did you take that into account when you were running these numbers?

A No.

Q When you accompanied Dr. Nutter to install the water level recorders, did you accompany him into Gar slough?

A On the first trip up there?

Q Yes.

A No.

Q Did you ever accompany him into Gar slough?

A Yes. We came back several months later and went into Gar slough, and installed the pressure transducer at that time.

Q Were you with him when that was, it was flooded in Gar slough?

A Yes.

[Page 2733]

Q And how many, how deep was the water in the areas where you were in Gar slough?

A Let's see, I'm trying to remember. To me, it was between knee-deep and hip-deep, somewhere above knee-deep.

Q What time of the year was that?

A I believe it was April. I can't remember for sure, but it was in the spring.

Q And Gar slough is not a GTR.

A No.

Q It just naturally floods, is that your understanding?

A Yes.

Q And that was in the year 2007?

A Yes.

Q What about Schaeffer's Eddy? Did you accompany him when he was installing or removing the piezometers?

A Yes.

Q Or the water level recorders. Did you accompany him when he installed them?

A Yes.

Q And was Schaeffer's Eddy also flooded?

A Yes.

Q How deep was the water in Schaeffer's Eddy?

[Page 2734]

A It varied. There were places where it was just below knee-deep. I believe there were a few places where it was just above knee-deep.

Q And Schaeffer's Eddy is not a GTR, is it?

A No.

Q That, like Gar slough, is also an area that just naturally floods.

A Yes.

Q You testified about some rainfall data?

A Yes, I looked at some rainfall data.

Q And I believe it was your conclusion that there wasn't a major difference. You didn't use the word "significant," but not a major difference between 1993 to 1999 and 1981 to 1992.

A That's correct, yes.

Q The rainfall data that you looked at, was it rainfall data from a particular location?

A I looked at two locations. I looked at the Corning area, and I looked at the Poplar Bluff area.

Q What about Pocahontas? Did you gather rainfall data from there?

A No. I looked at the areas for the gauges.

Q Well, the rainfall events that happen in Pocahontas aren't exactly what happen in Corning or Poplar Bluff, are they?

[Page 2735]

A I don't know. I didn't look at Pocahontas. I couldn't tell you if they were exact or not.

MR. SHAPIRO: May I have a minute, Your Honor?

(Pause.)

MR. SHAPIRO: Thank you, Dr. Overton. I have no further questions.

THE COURT: I have one, Dr. Overton. Could you go back to PX-506? I think it's your May 7, 2008, report.

THE WITNESS: Yes.

THE COURT: Could you please go to figure 4?

THE WITNESS: Yes.

THE COURT: Looking at these data, or it's actually a summary of data points, it occurred to the Court that the major difference -- also, I have open at the same time, I guess, a page that has table 1 and table 2 that you went through, where you had average days in '81 to '92, and then the average days in '93 to '99 at a couple gauge levels.

THE WITNESS: Tables 1 and 2?

THE COURT: Yes.

THE WITNESS: Yes.

THE COURT: I have all three. It appeared that the major difference was in the gauge level eight [Page 2736] feet to 10.5 feet for the month of February, March, April, May, June, and July.

THE WITNESS: Yes, sir.

THE COURT: Could you go back, though, and calculate the average days on Corning in that gauge range between '81 and '92, and contrast it to '93 to '99 in just the same way you did with Mr. Shapiro for the lower gauge reading?

THE WITNESS: It was in table 2?

THE COURT: Yes.

THE WITNESS: And we want eight to 10.5, is that correct, for the '81 to '92.

THE COURT: Yes.

(Pause.)

THE WITNESS: 29.66, '81 to '92, eight foot to 10.5 foot gauge.

THE COURT: I'm sorry, I didn't hear.

THE WITNESS: I'm sorry. The '81 to '92 period for the eight to 10.5 stage.

THE COURT: That was how many gauge?

THE WITNESS: The 29.66 is the total.

THE COURT: For the months of?

THE WITNESS: April through November.

THE COURT: Oh, April, okay. You took April. And the same for '93 to '99?

[Page 2737]

(Pause.)

THE WITNESS: 51.58.

THE COURT: All right. And again, that's for which months, Dr. Overton?

THE WITNESS: That would be for April through November, the years '93 through '99, the eight to 10.5 foot.

THE COURT: I think I understand how you constructed your table. Thank you. Mr. Morgan.

REDIRECT EXAMINATION

BY MR. MORGAN:

Q Dr. Overton, Mr. Shapiro asked you about some of your recommendations for further evaluation in the beginning of his cross-examination?

A Yes.

Q And at the time you authored the report, that was in 2001, is that correct?

A Yes, early 2001.

Q And after the report and before today, did you get some of this information that you were referring to in that report?

A Yes. The Game and Fish Commission installed some of the staff gauges that I recommended, and Dr. Heitmeyer did collect some of the additional other [Page 2738] data. Not in the same format that I would have done it, but in the format that he did it.

Q And this is some of the information that you were referring to in your report.

A Yes.

Q Mr. Shapiro asked you about the piezometers and the pressure staff transducers, is that correct? About establishing those in the WMA, your recommendation for those?

A I didn't recommend pressure transducers. That was Dr. Nutter. I recommended the piezometers.

Q But the piezometer issue has nothing to do with the two areas you're testifying to today, does it?

A No.

Q I have a question about the supermodel in Plaintiff's 492, when Mr. Shapiro referred you to page 4 of 50, which is on page 11608 of Plaintiff's 492.

If we refer to the three days in August of '93 that the supermodel estimated or simulated that the river would be above five feet at Corning, do you see that? In August?

A Yes.

Q The three days at the bottom of page 4 of 50

[Page 2739]

A Yes, I see that.

Q You see that? Okay. And the gauges were actually below five feet.

A The actual gauges were below five feet, yes.

Q So if you assume whoever was reading this gauge had their glasses on, then the supermodel simulation was wrong, was it not?

A I suppose.

Q If the Corps of Engineers decides to stop a deviation, say effective Tuesday, with the time delay between Corning, I mean between Poplar Bluff and Corning, is the effects of that deviation still felt down at the Corning gauge? Even though the deviations have been technically stopped at Poplar Bluff.

A Yes. We have a 48-hour delay between Poplar Bluff and Corning.

Q Mr. Shapiro asked you about other sources of water coming into the river, such as possibly farmers releasing irrigation water. That could happen every year, though, couldn't it?

A It probably does happen every year. I don't know the extent, though.

Q Mr. Shapiro asked you about, I believe it was in table, figures 3 and 4, I'm sorry, of the supplemental report that you did. Do you have that in [Page 2740] front of you?

A Yes. Figures 3 and 4?

Q Figures 3 and 4.

A Yes.

Q He was asking you about the months of I think July and August, is that correct?

A Yes.

Q Okay. What does the month of June show in those figures he was asking you about?

A June, the total for June would be 23.71 for the 1993 to 1999 period. Whereas in the 1981 through 1992 period it was 16.83.

Q And he asked you again about a couple of the months in the growing season, or during the growing season. But is it your opinion that the average days the Corning gauge was above five feet during the two different periods was higher during the period of '93 through '99, during the growing season?

A Yes. If you'll sum the totals across, it was higher for the '93 to '99 period.

Q And does that go also for the percentages of those months?

A Yes.

Q Mr. Shapiro asked you about the information received from the Game and Fish Commission on the [Page 2741] five-foot level?

A Yes, sir.

Q And he asked you who you received it from, when you received it, did you write it down. Do you remember that line of questioning?

A Yes, sir.

Q Is it your opinion that the pressure transducer graphs that are part of Dr. Nutter's report support that opinion?

A Yes, they do.

MR. MORGAN: Your Honor, we have tendered the exhibits, Joint 20, Plaintiff's 506, Plaintiff's 491, Plaintiff's 492, and I believe Plaintiff's 92, the CV, was already admitted.

THE COURT: Yes.

MR. MORGAN: I don't know if we're through yet, but I would tender those at the appropriate time.

THE COURT: Well, let's see if Mr. Shapiro has any re-cross.

MR. SHAPIRO: Briefly.

THE COURT: Yes, please.

RE-CROSS-EXAMINATION

BY MR. SHAPIRO:

Q On figure 3 and 4, I just want to make sure that the record is clear. Let's look at figure 4, [Page 2742] 1993 to 1999.

A Okay. On figure 3?

Q On figure 4.

A Figure 4, I'm sorry.

Q And does that include data from '93, 1993?

A Yes, from '93 to '99.

Q It includes data that was obtained from 1999, as well?

A Yes, through November 1999.

Q Okay. It does not include data from 2000.

A No.

Q And that was the year that there was a deviation.

A Yes, there was deviation.

MR. SHAPIRO: Okay. No further questions.

THE COURT: Thank you. I'm sorry, Mr. Morgan.

MR. MORGAN: We would move to admit the exhibits I just --

THE COURT: I just didn't hear.

MR. MORGAN: All I'm saying, other than to attempt to introduce the exhibits I just mentioned.

THE COURT: All right, thank you.

Mr. Shapiro, what is your view as to the admission of JX-20 and PXs 506, 492, and 491?

[Page 2743]

MR. SHAPIRO: No objection.

THE COURT: Admitted.

(The documents referred to, having been previously marked for identification as Exhibit JX-20, PX-506, PX-491 and PX-492, were received in evidence.)

MR. MORGAN: Thank you, Your Honor.

THE COURT: Now, Ms. Greathouse, where do we go from here?

MS. GREATHOUSE: Plaintiff calls Dr. Mickey Heitmeyer.

THE COURT: All right. Dr. Heitmeyer.

Whereupon,

MICKEY HEITMEYER, PhD having been duly sworn, was called as a witness herein and was examined and testified as follows:

THE COURT: If you would state your full name for the record, that would be appreciated.

THE WITNESS: My name is Mickey E. Heitmeyer.

THE COURT: Ms. Greathouse, you may proceed.

* * *

Trial Testimony of Mickey Heitmeyer

[Page 2756]

floodplain, there's a range of elevations, range of river levels in which that occurs, not just the one spot. And hopefully we'll get a chance to talk about how diverse, interesting this area is, and why it is not a dam or situation of just one input and one input, but perhaps even hundreds or thousands of points.

So we try and understand at what point that occurs. The first thing I did, obviously, was to ask questions of the Game and Fish, as any good person would do, because they're the people that have lived and worked there for 30 years. Other experts have testified the same way that, without exception, they've all said that somewhere between four and a half and six foot, the water starts to inundate the bottomland hardwood forest.

Q At four and a half and six foot?

A Four and a half to six foot at Corning.

Q Thank you.

A Yes, ma'am. The second one, and I have to indulge my duck-hunting preference here, I call it the duck hunter record. When I was on the WMA, and in fact I lived there during the year of 2005, the cabin

that I lived in had a little chart on the wall. Duck hunters live and die by water levels. And that little [Page 2757] chart had the Corning gauge, and also the elevation, and also the points at which the WMA would have had water on it. That's how they knew where to go to hunt ducks.

It's kind of interesting also that that information is published in the Jonesboro paper, The Corning Pocahontas. And if you looked at the paper last Thursday in Little Rock, and I suspect if you look at it tomorrow, you'll see that there's information in there about the elevations which water is at on the WMA, and how much of the area is actually flooded. So I call that the duck hunter record.

The third one are actual documents, emails, memos, individual documents that have been, a lot of which have already been admitted in this case, mostly from Arkansas Game and Fish interests. And they all, again without exception, talk about those levels and correlations. A very important one, of course, was from 1994 to 1995, information correlating the gauge at Corning and the gauge at Brookings, which we looked at on the field trip on last Friday. So a very, very deep body of information is provided in that.

In 2002 there was a test release. This may have been confused to some individuals, but there was a test release that was made. While it did not reach [Page 2758] a six-foot level at Corning, it did reach a 4.7. Mr. Hausman has already talked about it. There has been pictures admitted at a 4.7 level. We have information and we have evidence of what happened at that point.

In 2001, in March, there was another event. I will not call it a natural event, because it's not. There are always releases going on from Clearwater Reservoir. While they may not be deviations, they are releases. And for whatever reasons that occurred at that time, during 19 and 20 of March, the river was at 5.8, and then at 5.2. It was not at six foot; it was at 5.8 and it was at 5.2.

We just heard evidence from Dr. Overton and his analysis of all of the information that he has been given and has analyzed from some of the other experts on the other side. In 2005, I lived and worked on the area for over 100 days; took numerous observations, certain data, a lot of which -- in the case of what I do, I don't usually have to collect a lot of data, because a lot of it's already there.

My job is to assimilate and understand what information is out there. But of course, being the kind of inquisitive person that I am, I like to verify that. And I did. Not only did I see water on the area during that over 100 days I spent on it -- and by [Page 2759] the way, I've been going to that area since 1982. I like to hunt, again. And so I've been there quite often.

And so I took observations, recorded some of them, a lot of which ended up in the green book that's presented here. And so there was a lot of things that happened at that time. So there was just a lot of information that I gathered and used, and a little that I actually collected.

Q Back to what I believe you categorized as your second opinion, and please correct me if I state this improperly, but I thought that your second opinion, or

at least category of opinion, had to do with whether or not the water on the area caused damage to the hardwoods. Is that correct?

A Yes, ma'am. If you'll let me backtrack, because I also failed to mention some other information I think is kind of important in relation to what Dr. Overton just has already presented.

And that is, I talked about, you know, this notion of understanding at what level water begins to enter the area, and at what range it enters the area.

This notion of how long it was there comes from the public record of the different stages that are in the gauge data that he's already talked about [Page 2760] at Corning. So we have that information. So that data is really important and critical, because it gives us the real data on when the water in the Black River was at certain stages.

And so that gives me the information about how long and when it was there. So I apologize, I failed to mention that one.

Your second one about did this flooding and did the nature of it, the prolonged nature of it, was it sufficient to have caused tree mortality that was observed in the Kingwood study. And the information there comes from the scientific literature, which is very rich, and very deep, and very extensive.

Q And your third opinion had to do with other possible causes of the mortality that was measured by Kingwood, is that correct?

A Yeah. This is the scientist in me; I have to address competing hypotheses here. And we had apparently in this case three hypotheses, one potentially being this prolonged nature of flooding from 1993 to 1998. The second one would have been potentially has been raised at Greentree Reservoir or management by Arkansas Game and Fish. And the third one is beavers. And so I'm prepared to address that.

Q And the information that you've described [Page 2761] for either of your three categories of opinions, did you apply that information to arrive at your opinions in this case?

A Yes, ma'am.

MS. GREATHOUSE: Your Honor, I'm going to pass the witness at this time for voir dire, and ask to have him qualified. I don't know that I was able to catch the entire list, but generally in the areas of wetland ecology, bottomland hardwood ecology, and floodplain ecology. And I know the witness has listed some specifics that I don't have. But generally, those are the categories.

THE COURT: I suggest that those bottomland hardwood ecology.

MS. GREATHOUSE: Yes, Your Honor.

THE COURT: Dr. Heitmeyer, that's satisfactory.

THE WITNESS: If that's fine with you all, that's fine with me.

MR. SHAPIRO: I'm sorry. The witness is being offered solely as an expert in bottomland hardwood ecology?

THE COURT: Well, there's a whole list. But in any event, it's definitely an ecological focus. Because these are bottomland hardwoods, and they flood [Page 2762] periodically, the Court was just trying to focus this on bottomland hardwood ecology.

MR. SHAPIRO: Your Honor, if that's what he's being offered as a witness in, bottomland hardwood ecology, we have no questions.

MS. GREATHOUSE: Well, Your Honor, as clearly stated, there are categories he's obviously qualified in. And I think that maybe the United States is taking the Court's suggestion as to a general category a little too literally.

So if that is the case, we are offering him in wetland ecology, bottomland hardwood ecology, and floodplain ecology, not solely limited to bottomland hardwood ecology.

THE COURT: It seems to the Court that those other two categories are subsumed in bottomland hardwood ecology. I just asked Dr. Heitmeyer, is that right or wrong?

THE WITNESS: That is correct.

THE COURT: That is correct.

MR. SHAPIRO: I don't mean to belabor the point. I just wanted to make sure we knew exactly what he was being offered for. We have no questions.

THE COURT: I happily qualify Dr. Heitmeyer as an expert in bottomland hardwood ecology.

[Page 2763]

Ms. Greathouse, you may proceed.

MS. GREATHOUSE: Thank you.

BY MS. GREATHOUSE:

Q Dr. Heitmeyer, your report is lengthy and extensive, and we won't have time to go through every part of it today. I understand the general information that's in there, and I'm going to ask you to describe some of it specifically for the Court, as briefly as possible.

Can you explain to the Court what ecosystem exists on the WMA, and how you determined this?

A Yes, ma'am. And I believe, on page 15, there is figure 11. I don't know if we have something bigger than what's in here. But there's actually a map here that speaks to the habitat communities that are on the Black River WMA.

If you again follow my discussion of what HGM is, it's an understanding again of what communities belong in what settings. This is really remarkable, an interesting place, Your Honor. This was a former channel of the Mississippi River, when the Mississippi

River formerly turned at about Cape Girardeau, Missouri, which we have spoken about, and followed the Ozark Plateau. And it flowed down through this Black River, what's now the Black River [Page 2764] floodplain, until the Wisconsin glaciers started to retreat about 14,000 to 16,000 years ago.

At that time, the massive amount of water was coming from the meltwater of the glaciers actually caused a little lake to form about five miles from where I currently live, and it caused water to raise. So it broke through what we locally know as Crowley's Ridge. At that point then the river started to shift locations. And it eventually shifted to its current location.

What it left in its wake is this really interesting large floodplain setting that we're looking at here on the map. And the little tributaries that used to flow into the Mississippi River, of course, now were no longer entering the Mississippi River, but they still flowed into the floodplain. So we had this very wide floodplain.

Since it was oversized for the entry of the tributaries, as you can imagine then, the entry of these tributaries, they had no confines, so they wandered all over the place and created this labyrinth or spiderweb network of drainage systems that you previously asked about. And in our Arkansas terms, the sloughs and chutes and bayous and creeks and everything else. And left this floodplain setting.

[Page 2765]

This map is a geomorphic map that has been modeled by the Arkansas multi-agency wetland planning team. I did not create this; this was given to me by experts, including Chuck Klimus, who now works for the U.S. Army Corps of Engineers, Tom Foti, who was the chief ecologist for the Arkansas National Heritage Commission for a long, long time, and Jody Pagan, a name that's already been introduced, formerly worked for NRCS.

And this demonstrates what communities are present on the WMA. And you'll see that most of the area here is in yellow, and that is what we call, it's a riverain overbank bottomland hardwood forest setting. It obviously has great heterogeneity within it, but it is a riverain overbank bottomland hardwood forest.

Q And looking at this figure on page 12, I'm sorry, 15 of your report, I note that there are a number of pages attached associated with that figure, as well, that describe this in more detail. Is that correct?

A Yes, ma'am. Again, I'm interested in the very interesting history of this place.

Q Please describe for the Court the topography on the WMA.

[Page 2766]

A Yes, ma'am. And I think I followed the Judge's actual request from the field trip. The topography on it again, as you can imagine from what I've just described, is this kind of undulating kind of ridge and

swell, marked by a tremendous spiderweb network of chutes and sloughs and drainages that flow all the way through it. Again, there's not just one single entry or one single exit point, so you've got this amazing, almost like a washboard sort of surface that occurs across it.

From the top of the WMA to the bottom end of the WMA, ranges from about 280-foot elevation to 260. So there's about a 20-foot fall from top to bottom. And it averages one foot of fall per mile, I think the way, Your Honor, you asked that question on the field trip. So that's the rate of fall. It's relatively slight, as you can determine from those numbers.

And there's also, I think we have some other aerial photographs and things that kind of, if you're interested. For example, on page 39 of the green book, you'll see some infrared photographs that are in here. And if you will look at those, you can kind of tell by the dark coloration of it and the light coloration of it the nature, again, of this kind of network of sloughs and drainages and chutes.

[Page 2767]

And if you've got the green one or you don't, you can look up here, Your Honor, and see all of that really fascinating, amazing sort of network of the way the water moves through the site. So it's pretty cool. Sorry.

Q Dr. Heitmeyer, are you aware of any other information that would allow you to look at the network of how water might move on the WMA?

A Yes, ma'am. There's a lot of topographic maps, including kind of interestingly, the LiDAR maps that I think have already been discussed at some point, that the Corps of Engineers actually produced in the last few years. And those LiDAR maps show specific elevations on the WMA. And those LiDAR maps have got, you know, a lot of detail, a lot of information on them that speak to the elevation gradients, contours, diversity, heterogeneity, et cetera.

This picture right here is one of those, and it has got -- you might have to go to it, but you can I think see from here again kind of the dark and the light. Maybe this is too far away. But the dark and the light and the blue. This is actually the island GTR in the upper right-hand side, and the Reyno GTR that are outlined in red on this map.

[Page 2768]

And again, just the diversity of elevations and topography that's on the site is demonstrated.

MS. GREATHOUSE: Your Honor --

THE COURT: Before we take that down, what elevation is represented by the blue cast?

THE WITNESS: Most of the elevations that are shown on this particular map here are below the blue. I realize the legend is a little difficult to see, but it's below 266.

MS. GREATHOUSE: It's 22 and 23. Your Honor, I actually have a copy of this that I'll give to the Court so you can see it a little closer.

But for the record, we're looking at what's been marked as demonstrative exhibit 23.

THE COURT: PDX-23?

MS. GREATHOUSE: Yes, Your Honor.

THE COURT: All right.

MS. GREATHOUSE: And PDX-24.

(Discussion held off the record.)

MS. GREATHOUSE: Okay, 22. I'm sorry, marked as PDX-22 and 23.

(The documents referred to were marked for identification as Exhibits PDX-22 and PDX-23.)

[Page 2769]

BY MS. GREATHOUSE:

Q Dr. Heitmeyer, you were looking at the previous page of this, which was PDX-23. And now we're looking at PDX-22. And can you describe what is being depicted there?

A Yes, ma'am. This is a similar sort of map that we have up here, except this is showing the Winchester GTR that's outlined in red. The dark blue, or I shouldn't say dark blue, the blue snake sort of thing that's going through it is the Black River.

On the far left there, Your Honor, you may kind of see where we put the boats in at Schaeffer's Eddy on the left-hand side of that, and we subsequently went downriver. So this is that area.

Q Is the area, the topography of the area, homogeneous or heterogeneous?

A I think you could follow from what I just said, it's extremely heterogeneous, although relatively flat. We in the South, I think Dr. Baker also talked about, our ridges are five to six inches tall sometimes. So when we think of a ridge, it's maybe not the same as someone else might.

Q Are you able, Dr. Heitmeyer, to speak to the tree species composition that might occur at various elevations?

[Page 2770]

A Absolutely.

Q And what can you add on that topic?

A Oh, there's a huge body of information in the scientific literature from all sorts of places, including those HGM analyses that I just talked about. There's actually a matrix that is copied from the multi-agency wetland planning team. Let me change glasses again.

Table 4 on page 16 of the green book. It talks about the specific species that we would expect to find, and given sort of what we call mapping criteria. And again, if we know the soils, we know the geomorphology, we know the elevation, we know the flood frequency

contours, we can predict. We know essentially what's there.

For example, Your Honor, when we went into the Schaeffer's Eddy site, the site that had had damage in it, you will remember that we -- and I think Dr. Baker also spoke to this -- we transitioned extremely quickly from a predominantly willow oak zone into a zone that was predominantly nuttall, with a minor amount of sweetgum and overcup. Then we transitioned into a site where overcup was the predominant species. And then of course we entered the area which was killed. And it formerly also was [Page 2771] an overcup nuttall.

So this gradation of species is again widely known in all of the scientific literature. Anybody that's ever worked in bottomland hardwoods understands this gradation.

Q What is the elevation band at which the tree species at issue in this case occur? And I'm referring generally to nuttall and overcup oak.

A Yeah, I can't give you just a precise elevation for the whole place. Because remember, there's fall. There's about a 20-foot fall from the top to the bottom.

But we do know, again based on several pieces of information, that the nuttall overcup zone is about two-and-a-half-foot elevation gradient. So if you went to a location in the northeastern part of the area, and you recognized where that began, and it's roughly about two and a half foot high, higher in elevation from that bottom point, and you do the same thing going all the way down; those sort of elevations have

been confirmed by, again, many pieces of information. A very good one, of course, was a survey, actually surveyed in nuttall oak on the area that Martin Blaney in his testimony talked about.

* * *

[Page 2775]

A * * *

[Page 2779]

During that 1993 to 1999 timeframe that there were very significant changes that occurred in the number of days that the river was above that. These are actual data. Excuse me, Your Honor. These are not simulated, they are not hypothetical. They are real data.

* * *

[Page 2781]

* * *

Q Well, I'm going to follow up with a new question. And that is, you spoke to the fact that for this period in question, which is '93 to 2000, you stated there had never been another period for consecutive years of record where the number of days of flooding was--

A It's actually from 1993 through 1998.

Q Okay.

A Those six years consecutively, in every one of those years the river was at or above a five-foot level for at least 63 days. You'll see that, it's just a little line that goes across here. And in fact you'll see that in many of those years it was well above 63. But it was at least 63 days of flooding during the growing season for every one of those six consecutive years. That had never happened prior to 1993.

Q And why is that important?

A It's important, as I think everyone in the room will understand, because this is a unique event that had never happened before. And when we get to speaking of science in a minute, when we start talking [Page 2782] about hypotheses, I think you'll see that it's very important that this had never happened before.

So it's not just an interesting fact. It's highly in correlation with what happened.

Q Is there anything about the fact that it was consecutive that is of interest or importance?

A Absolutely. I'm not sure how far you want me to go here. But the bottomland hardwood forest -- and this has already been testified by Dr. Baker and some others -- is not adapted to six consecutive years of prolonged flooding.

It is adapted to periodic flooding. It is adapted to annual flooding at certain times. It is adapted on occasion to growing-season flooding. But it is not adapted to six consecutive years of this level of flooding.

* * *

[Page 2820]

(The document referred to, having been previously marked for identification as Exhibit 436, was received in evidence.)

BY MS. GREATHOUSE:

Q Dr. Heitmeyer, we've been talking before lunch and since about some various things you listed this morning that had formed the basis for your opinion.

A That's right.

Q And I'll just ask you, have we covered everything that formed the basis for your first opinion that the Corps's deviation caused increased levels that resulted in flooding on the WMA?

A I think maybe the only thing that we did not talk about, and I may be missing some because I said the list was fairly long. We had obviously the observations and communications with Game and Fish. We had all their documents and information. We have the duck hunter record. We have aerial photographs, we have ground photographs. We have the 2002 test release. We have the 2001 event that occurred. We have all of my observations that we've just talked about.

[Page 2821]

And the other one I don't think we talked much about was Jerry Overton's previous testimony and the

communication I had with him. And I've seen his documents to reanalyze the data from -- maybe I shouldn't say reanalyze, but looked at the data from Wade Nutter that also showed, from those pressure transducers or water level recorders, that it looked like that water was not draining off of the sites that we had until the water was below four and a half to four, I believe. I may have those numbers a little off, but they're certain below five foot.

So in other words, the water was not draining off the WMA until it dropped below five foot certainly, and we think in most cases it's quite a bit below that.

The other thing that I did not mention, and I should have -- and this has been covered by Dr. Baker's testimony already -- is that in addition to the surface flooding, and maybe we'll get into this with ecology of the trees and the root zone that we talked about. It's not just the surface flooding that makes a difference in those trees, it's the root-zone saturation. And that's about a foot to two foot below the surface.

So the extent of this flooding and [Page 2822] inundation is not just surface flooding, but also it's subsurface and root-zone saturation.

Q You mentioned aerial photos, and I don't think we talked about that. What aerial photos are you referring to?

A I looked at a lot of aerial photographs. Some were historic, some were more recent. I certainly have seen the video that we've looked at. I've seen the photographs that were taken from the various times. I'm sorry, I can't remember all of the dates of those.

But a couple of things impressed me with those. One, at the different periods of time that they were taken, there was either water or not water. And some of them were taken when there was quite a bit of water, so it shows just the extent of flooding on the area.

The other aerial photographs that we looked at have formed a backdrop for some of the exhibits and things that we've just talked about. And those are very insightful.

For example, the one we had with the LiDAR information, if you wanted to bring it back up and look at it again. It's an aerial photograph that clearly show the dark and the light in the woods, and [Page 2823] where the water is. I mean, there's no mistake about that, you know. We know where the water was because it shows up on the aerial photographs.

Q Are you able to say, do you have an opinion about how much flooding would have occurred without the deviation?

A All I know is from the information from the real data, and the real data that were presented in the green book. And they are presented in table 3, they are presented in figure 10, and I believe the other one was 22. Without a doubt, show that during the deviation period of 1993, in this case to '99.

And in retrospect, maybe I should have left this at '98. In fact, if anything, 1999 was a little drier year. So these numbers that are in here, if I had excluded '99, would have actually been higher than they are here.

So the number of days of growing season flooding above five foot and six foot in the bottom part of that, it's 29 days additional during that timeframe.

I know of no other explanation that would have led to this difference. The precipitation was not it. I've looked at the precipitation data, and I looked at the growing season data on precipitation [Page 2824] during this timeframe, and there's no difference. There is no statistical difference, I will say that, between the period of 1993 to '98, and the prior eight years, if you want to compare apples to apples.

In fact, I looked at it a minute ago, and I think in '93 to '98 it's 22.2 inches of precipitation during the growing season in those years. And in the pre-deviation period it was 21.6. The variation, there's no difference. Precipitation can't explain that.

There was one year, 1998, that was wet. We all acknowledge that. But there were other years in this period of record that were as wet or wetter. In fact, 1984, 1990, 1991, I believe 1994, a number of years that were just as wet or wetter.

This is not a precipitation deal here. This is not a result of that. Individuals have talked about well, below Poplar Bluff, between there and Corning. I know that area. I know it very, very well. There are no changes that have occurred in that system. There has been no recent diversions. There's been no new dams, there's been no other road construction. There's nothing that's occurred during this interval of time.

And so therefore, these changes, to me, [Page 2825] imply very real, demonstrable evidence. These are not

simulations. I honestly don't put a whole lot of faith in some of those simulations, because we've never seen the entry of it, the code, the assumptions. We know nothing about it. I don't know if it's any good or not. So to me, this is about as good a proof as you can get.

* * *

[Page 2849]

A And what page?

Q Twenty-nine. Are you there?

A Yes, I am.

Q In this section, and then continuing off onto page 30, especially table 6, there is a comparison, is there not, of a number of days of Black River gauge heights at certain levels from 1993 to 1999, as compared to 1981 to 1992?

A That is correct.

Q That's the same information that was in Dr. Overton's report.

A This came directly from his data, yes.

Q Dr. Overton testified that he believed the 1981 to 1992 was a fairly representative period of a non-deviated time period. Would you agree with that?

A I believe so.

Q On this page you state -- and this is on the second right-hand column, about 10 lines up. The sentence begins, "On average, deviated flows increase flooding."

A Which page are you on, please?

Q Twenty-nine.

A Okay, I was on the wrong page. Help me again?

Q This is on the right-hand column towards the [Page 2850] bottom.

A Yes.

Q "On average, deviated flows increased flooding by 7.21 days in May."

A Yes.

Q You don't have an opinion about how many trees died on the WMA because of that additional time period?

A Of those additional days in May, no, I do not.

Q And that would be true for the other numbers here, 6.88 days and 2.79 days?

A That is correct.

Q You don't have an opinion about how many trees actually died because of that.

A How many individual trees, no, I do not. From this data that we're just discussing.

Q Now, on page 30 we looked at that table. We're not going to go through that again; we did that with Dr. Overton.

On page 32 you've graphed some of this information. And that would be figure 22?

A Yes. Now, remember that this graph on figure 22 is not the same thing that you all discussed with Dr. Overton. Because these have growing and

* * *

[Page 2864]

you measured the Upper Island as 268?

A That's correct.

Q And the last date was 7/15. You also measured it at approximately 268.

A That's correct.

Q And that's true, even though there was almost a 1.34-foot difference at Corning.

A That's correct.

Q And looking at the 4/26 date.

A 4/26 is at 5.09 at Corning, and we had a 265.7.

Q So even though, if you compare the first two numbers, even though there is almost a two-foot differential, there is not a two-foot differential on the staff gauge, is there?

A Looks like there's about 2.3 to 2.4.

Q And that variability is just inherent in this system, is it not?

A Oh, absolutely. I mean, we think about this river, and I think someone else might have made mention of it, there's kind of these waves of water that go down the river. And as these waves of water pass through, they can, you know, the water is going up and down. Yes, sir.

Q As this suggests a seven-foot stage at [Page 2865] Corning may have the same impact, or a different impact, as an 8.4-foot stage at Corning.

A That's absolutely true.

Q Okay. Looking back now at the --

A I might offer that's why at any time it gets above five, we've got problems.

Q Looking back at your report at page 30. Let's look at 5.4 foot. These were your measurements on that date.

A What page, please?

Q Page 30 of your report. Another difference, Dr. Heitmeyer, one of the reasons there's such a

variability is also because you're looking at one day in isolation. And this would, in order to look at what the staff gauge would really be based on a Corning gauge, you'd have to look at more than just one specific date.

A I agree. I agree.

Q Right. It would depend if, for example, there was a very high Corning gauge a couple days before this. That would have potential impact.

A That is correct.

Q And if it were much lower, and then just raised up to 8.4 feet, that would impact this analysis.

[Page 2866]

A That is correct.

Q And in fact, it takes some time for the water to get from Corning into the WMA, to get to these staff gauges.

A That is also correct.

Q So if you're measuring it on a particular day, it might not make entirely good sense to look at what the Corning gauge was on that particular day.

A I think, as I've said before, you're correct. And the interesting thing that, I mean the important thing that we did is we did not rely on just one day or one set of data. But as I've indicated, I think there's about seven or eight different sources of information that we had that led to my conclusion about somewhere

between four and a half and five foot, that the water began to enter the WMA. And that's based on a lot of data.

Q Okay. Well, I want to look at the data, the hard data that's in your report. And why don't we do that by looking at table 7 now, at 5.4 feet? I believe you testified that at five and five and a half feet, there would be 30 percent of the nuttall oak that would be flooded?

A I believe -- it's in here. I believe I said these data indicate that a Corning gauge of five feet [Page 2867] floods greater than 35 percent of the nuttall oaks on the WMA.

Q Okay. Let's look at what happens, according to your measurements, at Upper Island. You measured it at 5.4. You measured it on that particular day. The staff gauge is 267.3, is that right?

A That's correct. That's correct.

Q And you estimated the nuttall oak range at 267.0 up to 269.5.

A That is correct.

Q So if these numbers are correct, then the 5.4-foot gauge at Corning would result in inundation of .3 feet of the nuttall oak within that particular GTR?

A Incorrect. That's not correct at all.

Q Because the water would spread out?

A Yeah. I mean, if you have a 45-degree angle, in other words, if for every incremental increase in elevation you had an incremental increase in water, it would be true.

But these things are not on a 45-degree angle. In other words, these are kind of bowl-shaped things. Again, my analogy of a bowl. You put water in it. A little bit of water can flood a lot of area. It doesn't necessarily have to flood just a little [Page 2868] bit. I hope that kind of makes sense.

Q No, it does. And what you're saying, if I understand you correctly, is that there would be water coming into Upper Island GTR in this particular instance.

A That is correct.

Q And the water would move to the lowest spot within that GTR.

A Yes, it would. I mean, water tends to be flat, so it would -- it will equilibrate to basically that level. So if we measured it at 267.3, we would kind of naturally assume that all the elevations that were 267.3 in the Upper Island at that time would have water on them.

That doesn't mean it's .6 percent of that area, because the areas are not, again, on that 45-degree slant from low to high. They are in a bowl shape. And therefore, there could be quite a substantial amount of water that would be in there, even though it was only three tenths of a foot deep.

Q And the conclusion you can draw from this, then, from what you're saying, is that certain trees in certain elevation locations are going to be impacted more at that level than other trees are.

A That is correct. That's why we saw the [Page 2869] heterogeneity of mortality on the site.

Q Let's look at page 11 of your report. And that would be -- as we're moving here I'll ask another question that occurs to me.

And that would be true for the other GTR areas, as well, in the other areas that you've read the staff gauges. Because each one is different.

A That's absolutely true.

Q At page 11, we're going to talk about draining from the WMA now. And if you look at the right-hand column on this page, right towards the end. I think this is the second-to-last sentence.

A Yes.

Q You state that BLH on the WMA does not completely drain until the Black River is less than four feet. And then you give the discharge.

When you say less than four feet, do you mean four feet at Poplar Bluff or four feet at Corning?

A All of this is at Corning. I choose Corning all the time, because Poplar Bluff is so far away it's actually not very useful.

Q Now, that number, less than four feet, that's based on what Dr. Overton told you?

A Yes, I believe it is.

[Page 2870]

Q Okay. On the next page --

A And I believe that was from many sources, but yes, I believe that's true.

Q All right. It's not something you actually measured.

A No, I did not.

Q Right.

A Now, when I say that, I take that back. As I'd indicated before, there are many, many observations that we had on the area. And I think, as I talked about before, we have photographs, we have my own observations, we have observations of other individuals. And we actually have some I think physical evidence showing that, you know, about four and a half water in some cases is, in fact, running into certain portions of the WMA.

Again, it's not equal across the areas, I think we talked about before. So there actually is a point of reference about that four and a half to four of actual observations from photographs, from memos, from data, from other things that we have, you know, used in the course of the preparation of this.

Q So the next sentence -- I'm sorry, were you finished?

A No, that's fine. Yes.

[Page 2871]

Q The next sentence reads, "Soils in the WMA are rain-saturated until the Black River is three to four feet." Is that also from the same dataset that you just described?

A The same things we've just talked about, and we've talked before. You know, the important thing is it's not just surface water, but there is a saturation zone in the soil.

Q Now, one thing you don't discuss is the drainage rate. It would take some time for the GTR areas, for example, once the Black River got down to the appropriate level, whether it's three feet or four feet, whatever that number might be.

A Yes.

Q Once it got down to a level where the GTRs could drain, in your opinion, it would take some time for that water to actually drain from the surface, is that right?

A I believe that's right. And I believe Dr. Nutter has some of that in his analysis, and I believe it's from one to seven days.

Q Okay. And then that would just take the water to the surface. And if I understood your testimony

correctly, that would get the water just to the surface. But it's also important to get the water [Page 2872] off of the roots.

A That is correct.

Q And that would, that would take additional time, would it not?

A Yes. I believe Dr. Nutter, and if his information is correct, and I'm not going to speak to whether his information is correct or not, but at least I saw a table I believe that he had prepared, that yes, it is for additional days. I mean, just kind of common sense that would occur.

Q Either of those things, those aren't something that you actually took data point measurements when you were on site.

A No, I did not.

Q There has been some discussion of piezometers. Dr. Overton discussed a work plan that he had put together to possibly install piezometers? Did you hear that testimony?

A Yes, I think so.

Q And you didn't install anything like that.

A No, I did not.

Q Or water level recorders.

A No, I did not.

Q Let's look at the tree core analysis. And I believe that starts right around page 31.

* * *

Trial Testimony of Glen Raible

[Page 2917]

A Not hydrology. I've had some hydraulics training at the Engineering Research and Development Center in Vicksburg, Mississippi.

Q The computer modeling that you've described, is that something that you use at your work with the Corps?

A Yes.

Q You described your current work with the Corps. How long have you been with the Corps of Engineers?

A Since 1980.

Q And can you just briefly go through your various jobs with the Corps, and briefly give us a discussion of some of the job responsibilities you might have had?

A Most of my responsibilities when I first started off with the Corps had to do with developing hydrology and hydraulics models for plain flood studies, for FEMA for doing flood insurance studies. Spent probably 10 years in that arena.

I've also spent time modeling large rivers, like the Arkansas River. Actually, in the last three years, I've spent approximately two years looking at designs along the Arkansas River system for going from a nine-foot navigation system to a 12-foot navigation [Page 2918] system.

Q That's on the Arkansas River? Okay. Mr. Raible, you've mentioned several different computer modeling software that you're familiar with. Are you also familiar with what has been termed the supermodel?

A Yes.

Q And has any of your work related in any way to the supermodel, or output of the supermodel?

A Over my career I have used output from the supermodel.

Q And in what capacity? How had you used that output?

A The output that comes from the supermodel is, in my field of work, has to do with using it to compute frequency and durations of specific locations along the rivers.

Q Okay. We're going to turn to the supermodel in just a second. But before we do that, let's talk about a completely different issue.

Were you involved in a proposed test release from Clearwater Dam? And do you recall when that was?

A 2001.

Q Okay. Do you recall what the outcome of that test release was?

[Page 2919]

A The test release was never made.

Q Okay. And when you say it was never made, could you describe what you mean by that?

A A test release was in the process of being organized and coordinated in 2001. However, and what that meant was that we had to store a certain amount of water in Clearwater Lake. It was going to take approximately 12 to 15 foot of floodwaters in Clearwater to have enough water to do the test releases that we wanted to do. That was never done.

Q Okay. And, I'm sorry, what was the reason that was not done?

A The reason it was not done was a little bit later in 2001, there was a natural-occurring event that produced a stage that had been deemed an impacting stage at Corning, Arkansas. And our project manager at the time, Chris Hicklin, called me and Jim Ellis, and said hey, this is an event that we can go up and look at and maybe get some good information.

Q You said it was a naturally occurring event?

A Yes.

Q What do you mean by that?

A I mean that the stages that were produced at Corning were from rainfall that had occurred below Clearwater Dam, so it was runoff that was occurring [Page 2920] from the intervening area between Clearwater and Corning.

Q Okay. I want to direct your attention to PX-637. And if you look in front of you, the document should be there.

A 637, yes.

Q Okay. Mr. Raible, do you recognize this document?

A Yes.

Q Okay. This document is already in evidence. And if you could look at the bottom of this first page and the carry-over page.

A Yes.

Q Is that an email? Do you recognize that email?

A Yes.

Q And what was --

THE COURT: Mr. Shapiro -- oh, I found it.

MR. SHAPIRO: I'm sorry.

THE COURT: Thank you. I knew I was going to have difficulty finding it, but I found it. Thank you.

BY MR. SHAPIRO:

Q Mr. Raible, what was the purpose in writing this email?

[Page 2921]

A The purpose of this email was, I was wanting to keep my former supervisor, Mike Hendricks, informed on just the going-ons of a project that he had been greatly involved with over the years. Mike Hendricks at the time was on a temporary assignment up at the Russellville Projects Office.

Q When you wrote this email, was it your intention to say that you agreed that Plaintiff's allegations that the deviations from Clearwater Lake had caused significant timber mortality, that those allegations were correct?

A I do not see where I said that in here.

Q Was that your intention in writing this?

A No.

Q When you sent this to Mr. Hendricks, do you have an understanding of whether Mr. Hendricks agreed with Plaintiff's allegation as I described them?

A No.

Q Did you ever -- do you know who Col. Tom Holden is?

A Yes.

Q Did you ever tell Col. Holden that Plaintiff's allegations that the releases from Clearwater due to the deviations were correct; that they really did cause significant timber mortality?

[Page 2922]

Do you recall telling anyone that?

A No.

Q Did you ever hear anyone discussing that, or agreeing with Plaintiff's allegations, within the Corps?

A In this email, Chris and Jim, it says here that I say that Chris and Jim have concluded that four-foot stage will impact the area. And they are going to recommend to the Colonel to return to the authorized plan.

Q Did you understand them to have agreed that the deviations were causing significant timber mortality on the WMA?

A They concluded that those releases were causing an impact.

Q Okay. You stated that you were involved in this site to the WMA, is that right?

A Yes.

Q And do you recall being on the WMA, looking at the water levels?

A Yes.

Q And what do you recall seeing when you were on the WMA at this time?

A I recall at the time, we took a boat trip, a small, flat-bottom boat, Jim Ellis, Chris Hicklin and [Page 2923] myself. We traveled down the mainstream of the Black River Channel from Brookings. We traveled downstream approximately, I don't know, three or four miles, and then returned.

What I recall seeing at that time was basically bankful flow in the Black River. And by that I mean certain locations along the river, there's approximately one foot of free board between the top bank and the water surface. And in other areas where there's a little bit lower bank line, there was water out over the top bank extending out into the floodplain or overbank.

Q Okay. What happened after you sent this email, to the best of your recollection?

A After this email was sent, Chris Hicklin and Jim Ellis said that, based on the site visit, that they said there was significant reason to believe that the six-foot stage at Corning was having impact in the wildlife management area; and that, at that point we should return to the authorized regulation plan.

Q Are you aware of any studies that the Corps undertook after this time, related to releases from Clearwater or the WMA?

A There was an attempt after this to start developing an extensive hydraulic model of the [Page 2924] wildlife management area.

Q Okay. And when you say a hydraulic model, explain if you could what that would entail.

A The hydraulic model that we were using was HEC-RAS. Basically what you input into it is detailed topographic information. And in this case, also all the ponding areas and structures that the Game and Fish operate in the wildlife management area.

Q When you say topographic information, do you mean topographic information of the WMA?

A Yes.

Q Okay. And so you mentioned some of the data you would need in order to construct the hydraulic model. Were there other data that you would have to gather in order to prepare this kind of model?

A Well, you would need to know what flows you want to investigate.

Q Okay. And why would you need topographic information and elevation data information about the structures?

A So that you could determine what the critical flow paths through the area were, so that you could actually define what the elevations for the flows were throughout the entire system.

Q Were you involved in determining what data [Page 2925] might be needed in order to prepare this hydraulic model?

A I advised my supervisor at the time we were talking about what needed to be done. And yes, I was involved in advising him on the type of data and modeling that we should do.

Q And do you recall approximately when you were involved in discussing this with your supervisor?

A It would have been most likely 2001 or 2002.

Q Okay. And did you think at the time that it was a good idea to develop a hydraulic model like the kind you're discussing?

A Yes.

Q And why do you think that?

A Because based on the site visit that I had been on with Chris Hicklin and Jim Ellis, I did realize that there was reason to believe that possible impacts were occurring in the area. In order to determine what those impacts might be, a detailed model needed to be developed.

Q And would you have been in favor of preparing this kind of hydraulic model if you were convinced that Plaintiff's allegations that the deviations had caused significant timber mortality were correct?

[Page 2926]

A No, I would not have seen a reason to develop a model then.

Q Okay. I want to turn back now to the supermodel, which you mentioned early in your testimony.

During your deposition you stated that you could not recall what "super" stood for. Is super an acronym?

A No, it is not.

Q Describe for the Court --

THE COURT: Mr. Goodhart?

MR. GOODHART: I'm going to object. I guess counsel is leading Mr. Raible through his deposition now. I guess I'm going to object on the basis of leading and introducing deposition testimony.

THE COURT: To try and refresh his recollection with what happened in the deposition. We haven't gotten to that point yet, Mr. Shapiro. Why don't you just treat this as a straight direct examination?

MR. SHAPIRO: Yes, Your Honor.

BY MR. SHAPIRO:

Q Describe, if you could -- we'll just back up to that question. Is "super," is that an acronym?

A No, it's a moniker.

[Page 2927]

Q I'm sorry?

A A moniker. It's just a nickname.

Q Just a nickname, okay. Describe if you could what the supermodel is.

A A supermodel is a numerical model that was developed in order to investigate impacts, hydrologic impacts to reservoir systems.

Q Is it possible -- how would one use the supermodel? Is it possible to model different reservoir operations? Is that what it's modeling?

A Yes.

Q Who developed the supermodel?

A Actual computer software was developed by our Division Office in Dallas.

Q And was it developed by one individual?

A The most significant part of the model was developed by Ron Hula.

Q Okay. And he's in the Dallas office you said?

A He was. He's retired.

Q All right. Do you have an understanding of when the supermodel was developed?

A He initiated the software development in about 1968.

Q And how long has the Corps used the [Page 2928] supermodel on Clearwater Lake?

A Our division office helped develop the White River system model in the mid-seventies.

Q And has the Corps used the supermodel since that date?

A Our district has used super for modeling alternative regulation plans since the mid-seventies.

Q And does the Corps continue to use the supermodel today?

A Yes.

Q For what purpose?

A Any time there's any type of study that you want to investigate changes in regulation plans, that's when we use super.

THE COURT: May I interject with just a really quick technical question?

Mr. Raible, you testified that in the mid-seventies, a White River, and there was something else. What was that?

MR. SHAPIRO: I believe you were discussing the creation of the supermodel.

THE COURT: Yes. But there appeared to be an adaptation or modification of the model for the White River? Is that right?

THE WITNESS: Now, the software is just [Page 2929] basically a basic software package. To become an actual model for a specific basin, I mean, super is used on the Arkansas River, the Little Red River. So the model for the White River system was developed in the mid-seventies.

BY MR. SHAPIRO:

Q Now, when you say the White River system, would that include the Black River?

A Yes. The Black River i a tributary to the White River.

Q And when you say that it's been used on the White River Basin since that time, is it, are there certain things that are done to the computer model to make it applicable to different river basins?

A Yes.

Q Okay. And do you have an understanding of what those things are?

A Yes. You have to input specific information into the computer software to make it describe your basin.

Q Okay. During your experience with the Corps, have you ever been involved in a project where data from super was used? Okay. And can you give us an example of a project where you used data output from supermodel?

[Page 2930]

A As far as projects, on the White River system a couple years ago I was involved in looking at output for the study on the minimum flow study that's currently ongoing in our district.

Also in the last three years, on the Arkansas River, for the navigation system, I've used super data output.

Q Previously you discussed the difference between a hydraulic and a hydrologic model. Is super a hydraulic or hydrologic model?

A It's a hydrologic model. That's what it's used for, to look at the differences in the hydrologic regimes based on different regulation plans.

Q I believe you testified that the supermodel can be used to simulate different reservoir operation plans? Can you describe generally how the Corps uses supermodel to simulate different reservoir regulation plans?

A Can you repeat that?

Q Can you describe generally, can you describe generally how the Corps uses the supermodel to simulate different reservoir regulation plans?

A The supermodel, what you do is you input whatever different regulation plan, and then compare that to your base condition or natural conditions, to [Page 2931] come up with your economic differences, so you can decide on what plan is best to use.

Q Okay. You mentioned some inputs into super. Do you have an understanding what the inputs into the supermodel are?

A Yes.

Q And what are those?

A Basically, there's three types of input that have to be into the model to come up with your basin model. Number one, you have your reservoir inputs, which basically describe the volume of water that your reservoir can hold, and the releases that your reservoirs can make.

Number two, you have a downstream regulating control point that sets the limits on the amount of flow that your reservoir can release.

THE WITNESS: Is there some water here?

MR. SHAPIRO: Yes.

THE WITNESS: Thanks. Okay. And number three, you have to input your hydrographs that describe the intervening flow between your reservoir and your control points.

BY MR. SHAPIRO:

Q Okay, that last one might be a little bit confusing. When you say intervening flows, what do [Page 2932] you mean by that?

A That is the flow that is uncontrolled or unregulated. And it's the flow that occurs in the basin

between the reservoir and whatever control point you're looking at downstream.

Q So for purposes of Clearwater Lake, would the intervening flows, where would those intervening flows be coming into the river?

A Well, any tributaries that exist downstream of Clearwater Dam until you get to your next control point. The first control point below Clearwater Dam is a regulating control point, and it's Poplar Bluff.

Q Once you have all the inputs together, and you said, if I understood you correctly, that one of the inputs is the proposed regulating system that you're going to be, parameters that you're going to be actually testing, is that right? Okay.

Once you have all that together, then what happens next if you wanted to use the supermodel?

A Once all the inputs are into the program, it's just basically like any other model. You just execute the program, and it does its computations.

Q Okay. And what is the output from the supermodel?

A The output from the supermodel is whatever [Page 2933] period of record you input into it gives a daily value for your reservoir elevation, your reservoir releases, and the flows at any or all of your downstream control points.

Q Mr. Raible, what is the regulatory gauge for Clearwater?

A Poplar Bluff.

Q And when you just used the term "control points," is that what you meant?

A Yes. They're called control points.

Q Are there other control points that would be output from supermodel, other than Poplar Bluff?

A On the Black River? Yes.

Q Okay. And what are those?

A Downstream from Poplar Bluff you have Corning, then you have Pocahontas, then you have Black Rock.

Q Is Black Rock located south of Pocahontas?

A Yes.

Q All right. So if I understood you correctly, one of the outputs would be a daily flow from each of those control points?

A Yes.

Q Do you have an understanding of whether the supermodel can accurately simulate different operating [Page 2934] parameters of the reservoirs?

A The supermodel does an excellent job of reproducing what is called real-time releases or regulations.

Q And what is that understanding based upon?

A Can you repeat that?

Q What is your understanding that it does an excellent job, what is that based upon?

A That's based upon the output that I have from supermodels from different types of plans in evaluating frequency and duration data, and comparing it to observed gauges, gauge data.

Q Is the supermodel computerized intent to correlate the river stage at Poplar Bluff and the river stage at Corning?

A That's not the intent of it.

Q At some point, were you asked to provide information for purposes of this case? At some point, were you asked to provide information for purposes of this case?

A No.

Q Was someone from your office asked to provide information for purposes of this case?

A Yes.

Q Okay. And do you recall when that request [Page 2935] for information came?

A In 2007, late 2007. November 2007.

Q And do you have a recollection of what the information was that was provided for purposes of this case?

A Yes. I actually provided information, super output for Corning, for the period of record. No, no, it wasn't the period of record. It was just from 1993 through 2000, the output flows for the non-deviated regulation plan at Corning. I also provided a brief description of a supermodel, and also a list of deviations.

Q Okay. And when you say the non-deviated regulating plan for Clearwater, explain if you could what you mean by that.

A That is just the authorized plan of operation. In other words, we are modeling an actual plan, and there is no deviations in the plan of the model.

Q And do you have an understanding of what happened to that data that you provided in November 2007? How it was used for purposes of this case?

A I believe Dr. Wade Nutter is the person I furnished that information to in order to compare observed gauge data with the, with the regulation or [Page 2936] non-deviated plan from super.

Q And have you seen Dr. Nutter's report?

A Yes.

Q And there are several graphs in his report, is that right? Have you seen those graphs?

A Yes.

Q Do you have an understanding of what those graphs are based upon?

A Yes.

Q What is your understanding of what datasets those graphs are based upon?

A The graphs that I saw were datasets from 1993 through 2000, showing the hydrographic Corning, comparing observed data with the output from the non-deviated plan on super, from super.

Q Now, what is your understanding of when that data was generated?

A The actual data that I sent Dr. Nutter had been generated from a super run done in May of 2007.

Q Do you have an understanding of why that run was done in May of 2007?

A That run was done in 2007 because at the time there was additional, or another study going on that required additional plans of operation for Clearwater Reservoir.

[Page 2937]

Q And do you have an understanding of what that other project was?

A Clearwater Dam has been classified as a DSAC-1 dam. And we were in the process of doing an

interim risk reduction measures plan. And what that entailed was looking at alternative release plans in order to evacuate floodwaters out of Clearwater at a faster rate in case of an emergency, or just to reduce the durations of floodwater on the dam.

Q Did the generation of the supermodel data have anything to do with this case that you're testifying in today?

A No.

Q You stated earlier that you had provided a deviation list to Dr. Nutter.

A Yes.

Q What do you mean, a deviation list?

A We have a record of all the requested deviations to the authorized control plan that have been approved, or -- yes, have been approved.

Q And are you aware of what happened to the list of deviations that you provided to Dr. Nutter? Let me ask that question again.

Do you know whether Dr. Nutter used the deviation list that you provided him for purposes of [Page 2938] his report?

A I don't understand the question.

Q You provided a list of deviation --

A I provided Dr. Nutter with a list of the deviations.

Q Right. My question was not very clear. Do you have an understanding of whether Dr. Nutter used that data that you provided him in his report?

A Well, yes, he did use it for determining what the difference in the deviations were, as compared to the authorized plan.

Q And the list of deviations that you provided to Dr. Nutter, do you believe that list to be accurate?

A Yes.

Q And why do you say that they're accurate?

A The list of deviations are accurate because that's what came out of our files. I compared them with those file records.

Q Okay. At any point, did you have any discussions with Dr. Nutter about the deviations or the supermodel?

A Yes.

Q And what, just in general, did you and Dr. Nutter discuss?

[Page 2939]

A Basically, we just discussed how super, how the supermodel worked and the type of data that it generated, and what the purpose of it was as far as

comparing regulated plans versus observed plans, in order to determine differences that you would see based on different regulating plans.

Q And did you answer any questions Dr. Nutter might have had about how the supermodel operates?

A Yes.

Q Okay. I'd like to show you a copy of Dr. Nutter's report, which I believe has been previously marked as Defendant's Exhibit 310.

A Okay.

Q We've been talking about Dr. Nutter's report. Does this appear to be a copy of the report that you've seen?

A Yes.

Q You mentioned some, or we discussed some graphs. And I want to direct your attention to figure 13 of this document. And there is no page number. If you go past the numbered pages and find figure 13, you should be able to find it.

A Okay.

Q When we were discussing the graphs that appeared in Dr. Nutter's report, are these the graphs [Page 2940] that you were referring to?

A Yes.

Q And are these the graphs that are based, at least in part, on data that you provided to him?

A I provided him the data for the super, for the super discharge, yes.

Q Okay. If you could look at figure 13, 14, 15, through figure 20. Does that all appear to be based, at least in part, on the supermodel data that you provided to him?

A Yes.

Q You mentioned that you also provided a list of deviations to Dr. Nutter. I want to look at that. If you look at table 1, which is the first page after the signature page.

A Okay.

Q Do you see that list there? It's titled, "Implemented Deviations?"

A Yes.

Q Does that appear to be the list of deviations you provided to Dr. Nutter?

A Yes.

Q And then one other thing, we'll sort of jump around here. But if you go towards the back of this document, there's Appendix A. It's right towards the [Page 2941] back, probably the last document before the CV.

A Okay.

Q Okay. This is titled, "Appendix A, Southwestern Division, Reservoir Regulation Simulation and Computer Model Description, Super?"

A Yes.

Q What is this document?

A This is just a general writeup of the supermodel of basically what the hydrologic process that is used, and the inputs that are required.

Q Is this something that you personally generated?

A This writeup?

Q Yes.

A No.

Q Okay. Basically this describes how the supermodel works, is that right?

A It's just a basic description, yes.

Q Okay. And did you provide that document to Dr. Nutter?

A Yes.

Q And do you believe it to be an accurate summary of the basis of how the supermodel works?

A Yes.

MR. SHAPIRO: Your Honor, if I could have a

* * *

[Page 2955]

became aware of the supermodeling.

Q The data in the two attachments, the ones that I've shown you, Plaintiff's Exhibit 999 and Plaintiff's Exhibit 868. Do you know who ran the model in order to generate that?

A The actual execution of the model was either run by Chris Riecks in our reservoir control section, or Mr. Ron Hula.

Q Okay. So you didn't actually run the model.

A No, no. I've never run, I have never run super to generate any data. I've never input any data into the super.

Q You've just used information that's output, is that right?

A That's correct.

Q Do you know what are the assumptions that are built into the model?

A I know the basic assumptions, yes.

Q Can you tell us what those are?

A Basic assumptions are that you have flows that are being released from a reservoir, and are routed down the control points below the reservoir. And those releases are added to the intervening flow at the control points, to come up with a regulated hydrograph at the control point.

[Page 2956]

Q Do you know what is the estimated error in the model?

A When you say estimated error in the model, there's many ways to look at estimated error. I mean, the thing calculates what you tell it to calculate. There's no error in the calculations of the model.

Q How do you know whether the output, when the model is run, is accurate?

A You look at the output of the model. You can examine the flows and compare them, and see that they reproduce the flows that you would expect to see. Like I said, I've used supermodel output for comparing durations and frequency at specific gauge locations, and compare it to observed data, and come up with excellent correlations.

Q But you had never done that before for data that was based on the Corning, Arkansas river gauge, had you?

A No. I'm talking about along the Arkansas River, control points for supermodels along the Arkansas River, and also for control points along the White River.

Q Okay. Do you have any, do you know what the quality assurance and quality control information is for the supermodel?

[Page 2957]

A Only that this model has been used by our division or our district for over 30 years. The supermodel is used by all of our districts in the Southwestern Division, and has been being used for, since the 1970s, and is widely accepted as the best tool available.

Q All right. I've asked you these questions about what you had talked about in your deposition, and of course we're hearing today about some information now that has the Corning River gauge data that's been input into the supermodel.

Can you tell the Court that, as of the time you were deposed, the modeling, the supermodeling that was available from the Corps of Engineers Little Rock District was only based on the Poplar Bluff river gauge in determining the river level at Poplar Bluff, and not at Corning?

MR. SHAPIRO: I'll object to the form of the question.

MR. GOODHART: Let me withdraw the question. That was a poor question.

BY MR. GOODHART:

Q The scope of the supermodeling that had been done prior to July 2006 was only for determining the level of the Black River at Poplar Bluff, Missouri,

* * *

[Page 2965]

output? It's all headed with, these columns are all headed with the word "White?"

THE WITNESS: Yes.

THE COURT: The running of what you would call the White River system?

THE WITNESS: The White River Basin.

THE COURT: Basin, okay. And let me just see, I'm going to try to clarify in my own mind what your testimony was.

I had heard you say, I thought I heard you say your attempt, your suggestions to your superior in 2001 and 2002 that were never completed really involved also topographic information.

THE WITNESS: As well as flow.

THE COURT: Is that correct?

THE WITNESS: Yes.

THE COURT: Have you ever done that with this?

THE WITNESS: We have not completed that model, no, sir.

THE COURT: Are you still working on it?

THE WITNESS: Not presently.

THE COURT: Have you ever tried, on the White River system, to calibrate the predictions from the supermodel with the actual results measured on the [Page 2966] gauge?

THE WITNESS: That is the basic way that the intervening flow hydrographs are determined. The original input for the intervening, that is how they're determined, from that gauge data.

THE COURT: And you can adjust those.

THE WITNESS: Yes, you can.

THE COURT: And that's my question. Have you ever gone back in and tried to adjust?

THE WITNESS: I have not.

THE COURT: Do you know if anyone has? Tried to calibrate the thing back so it is more precise and more accurate?

THE WITNESS: I don't know.

THE COURT: Okay. So, well, we'll just leave it at that. All right.

Mr. Shapiro.

MR. SHAPIRO: Thank you.

REDIRECT EXAMINATION

BY MR. SHAPIRO:

Q Mr. Raible, is the supermodel output predictive in the sense that it predicts what the flows might be at some point in the future on the Black River?

A No.

[Page 2967]

Q Why is that? What is the output of the supermodel?

A Your input into the supermodel is based on your period of record. In other words, you're using data, observed data. The only prediction factor in it is, which is not really a prediction, is that the original process in which super steps through on determining the flows is set up to be realistic of a real-time forecast that an engineer operating the project, or a project manager would be operating the project. So that's the only type of prediction that the supermodel has.

Q You talked about the intervening flow hydrographs. Are those predicted, or is that based on past known information?

A That's past known information.

Q Okay. So the error rate, would it be true then that the error rate of those intervening flow hydrographs would have an error rate of nothing, because it's known information? Or maybe not zero, but a low error rate, is that right?

A Well, there's always, I mean, just the inaccuracies of the gauge data that you're using will introduce some error. And there is routing of the hydrograph, which also is not exact. So there's

* * *

Supreme Court, U.S.
FILED
JUN 27 2012
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No. 11-597

In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

JOINT APPENDIX Vol. 2 of 3

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The following opinions, decisions, judgments, orders, and exhibits have been omitted in printing this joint appendix because they appear on the following pages in the appendix to the Petition for Certiorari:

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IN THE UNITED STATES COURT OF FEDERAL CLAIMS

Docket No.: 05-381L

[December 1, 2008]

ARKANSAS GAME & FISH COMMISSION,	)
Plaintiff,	)
v.	)
UNITED STATES,	)
Defendant.	)

Courtroom 2C
Richard Sheppard Arnold
U.S. Courthouse
700 West Capitol Avenue
Little Rock, Arkansas

Monday,
December 1, 2008

The parties met, pursuant to notice of the Court, at 9:30 a.m.

BEFORE: HONORABLE CHARLES F. LETTOW
Judge

* * *

Trial Testimony of Dr. Wade L. Nutter

[Page 3026]

PROCEEDINGS

(8:15a.m.)

THE COURT: May I take a moment before we begin, Mr. Shapiro, to say that the Court denied the Plaintiff's renewed motion in limine to strike any evidence or testimony that relates to the Super Model.

May we continue, Mr. Shapiro?

MR. SHAPIRO: Thank you, Your Honor.

The United States calls Dr. Wade Nutter.

Whereupon,

WADE L. NUTTER

having been duly sworn, was called as a witness and was examined and testified as follows:

THE COURT: Please be seated in the witness stand.

If you would please state your full name for the record, that would be appreciated.

THE WITNESS: Wade L. Nutter.

DIRECT EXAMINATION

BY MR. SHAPIRO:

Q Good morning, Dr. Nutter.

A Good morning.

Q Dr. Nutter, where do you live?

A Athens, Georgia.

Q And where are you employed?

[Page 3027]

A I'm employed at Nutter & Associates, an environmental consulting firm in Athens.

Q What is your position there?

A I am president and senior scientists.

Q What are your current job responsibilities?

A Well, all the administrative responsibilities for running the company. I also manage and direct projects that we have as an environmental consulting firm.

Q Is there a particular focus of your environmental consulting firm?

A Soils, hydrology and also one niche that we have carved out is the land application of wastes, which incorporates all the knowledge and expertise we have in hydrology and soils.

Q How many employees?

A We have 12 employees.

Q And how long have you been president of Nutter & Associates?

A I started the company when I was professor at the University of Georgia in 1984. So almost 25 years.

Q Take a look at your resume. Do you have a copy of DX-310 in front of you.

A Yes.

[Page 3028]

(The document referred to was marked for identification as Defendant's Exhibit No. 310.)

MR. SHAPIRO: Your Honor, this is Dr. Nutter's expert report.

BY MR. SHAPIRO:

Q If you could turn to the back of this document. This was a document we used with Mr. Raible yesterday.

THE COURT: Yes. I just have to find it.

BY MR. GOODHART:

Q Dr. Nutter, do you recognize Defendant's Exhibit 319?

A Yes.

Q I believe there is a copy of your CV that starts on the third page from the back.

A Yes.

Q Would you turn to that, please?

A Yes.

Q Is this a current copy of your CV?

A Yes, it is.

Q Referring to this document, can you just describe your educational experience?

A Yes. I graduated from Penn State University in 1960 with a degree in forest science, and my course [Page 3029] work there was the traditional forestry degree at that time, the same courses that Dr. Baker described.

Then I got a master's degree from Penn State University in 1964, and my concentration there was hydrology, soils and groundwater hydrology. Then in 1968, I received a Ph.D. degree from Michigan State University when my emphasis there was in engineering hydrology, soil physics, and groundwater hydrology and geophysics.

Q Your master's on your resume states that it's in forest hydrology. Could you describe what forest hydrology is?

A Well, forest hydrology is, as opposed to engineering hydrology let's say, if we could make the distinction between the two, where that might be more focused on structures and controlling whereas forest hydrology is the management of forests with hydrology or water being one of the resources.

Q Was that a particular focus of yours, your educational background?

A Yes.

Q And your current job responsibilities, is that a particular focus of yours?

A Forest hydrology is, but a broader scale of hydrology, yes.

[Page 3030]

Q If you look at your professional experience, the last thing that's listed there is -- you were also a member of the Corps of Engineers Task Group?

A Yes. The Waterways Experiment Station in Vicksburg, Mississippi, for the Corps of Engineers also has responsibility for developing techniques for wetland assessment, and as part of the regulatory program the Corps is responsible for, and I was a member of the task force that developed the hydrogeomorphic functional assessment for wetlands and riverain systems, and we developed that methodology, and then we wrote guide books for a number of different ecosystems from New England, across the southeast, into the southwest, northwest, north central states.

Q You heard Dr. Heitmeyer testify yesterday?

A Yes.

Q Is that the same hydrogeomorphic functional assessment that he was discussing?

A Yes.

Q I'm sorry. You said you wrote a portion of the --

A I was the hydrologist on the task force team so, of course, I wrote the sections dealing with the hydrologic assessments.

[Page 3031]

Q Have you published any professional articles in the field of hydrology?

A Yes, I have.

Q And have you taught courses in the field of hydrology?

A I have. I was professor at the University of Georgia, retired in 1997, and during that time I taught undergraduate classes in hydrology and soils, watershed management. I taught graduate courses in hydrology, hill slope hydrology, environmental monitoring, hydrologic modeling, and some soils, advanced soils.

Q Do you belong to any professional organizations related to the field of hydrology?

A I do. The American Water Resources Association, the Water Environment Federation, American Geophysical Union, and the American Institute of Hydrology.

Q Do you have any experience with computer simulations of river flows?

A I do. A very recent case in point. South of here on the Ovachita River is a large tract about 17 or 18 thousand acres that had a levy built around it. It's on the Ovachita River just south of Felsonthal in Louisiana, just a mile or so south of [Page 3032] the Arkansas border, and that land had been acquired by the U.S. Fish and Wildlife Service and their objective was to breach the levies and restore the wetland system that had been drained back in the sixties for agriculture.

And I directed a project to determine where those breaches would be and the modeling necessary to confirm that that was the case for their present breaching and the future breaches that would occur as they got more money to remove the levies.

Q Before you became involved in this case, were you aware of the computer model called the Super Model?

A I was. When I taught hydrologic modeling, I started that course in the mid-eighties for advanced graduate students, and I had a colleague that worked for the Corps of Engineers at the particular time. He was working for the Waterways Experiment Station in Vicksburg, but he was had worked for the Southwestern Division of the Corps, and I was looking

for different types of models that I could demonstrate to the students, and he sent me descriptive material about the Super Model as a model that wasn't a predictive model.

Q So you said it was not a predictive model?

[Page 3033]

A It was not a predictive model, correct.

Q Was that the same Super Model that Mr. Raible discussed yesterday?

A Yes.

Q Do you have any professional licenses?

A I do. I'm a professional hydrologist with the American Institute of Hydrology, and up until this past year when I was retired I was a professional forester in Georgia.

Q Just very briefly if you could describe, you talked about your educational background, if you could just talk about your work history that is particularly relevant to your responsibilities for purposes of this case.

A Well, I went to -- became an assistant professor at the University of Georgia in 1968, and spent 30 years teaching and so forth, but during that time I also did a good bit of consulting work. I use consulting to give the students real life projects to work on and frequently got funding for those projects from various sources.

In 1984, as I mentioned earlier, I started a small consulting firm with some former colleagues, and we did a lot of these types of projects involving hydrologic modeling; as I mentioned earlier, land [Page 3034] application lease, but that's not related to this, but a lot of the work was done in riverain systems throughout the southeast which were subject to off-and-on flooding and so forth.

Q Have you ever testified as an expert in court?

A I have.

Q Do you know how many times you've done that?

A In federal court, probably five or six times, numerous times in the state courts.

Q I take it you were qualified as an expert in those cases?

A I was.

Q In what field were you qualified?

A Hydrology and soils usually.

Q Would you consider those to be your areas of expertise?

A In some cases I was qualified as a wetland hydrologist, but that's just sort of the subset of hydrology, yes.

Q When were you hired by the Department of Justice for purposes of this case?

A I was first contacted, I believe, in late spring or early summer of 2005. I'm not sure exactly when we had a contract, but it was around that time. [Page 3035] I know we had a contract by early fall.

Q What were you asked to do?

A I was asked to evaluate given existing information and any site-specific information I deemed to be necessary to determine if the Corps' management of Clearwater Lake had any influence on the duration and frequency of flooding in the Dave Donaldson Black River Wildlife Management Area.

Q Can you describe the kind of facts or information that you considered in evaluating those issues?

A Yes. We obtained very early on, from the Corps we obtained discharge records from the dam, from Clearwater Dam. Then we also gathered from the USGS flow data at Corning and at Poplar Bluff, and this was average daily flow that's published as a matter of course. We also then later on obtained from the Corps the same data set but also stage records for those same stations. In other words, the height of the water at those two locations.

We also gathered rainfall for a number of stations around the basin, and then with respect to site-specific studies at some later date we put in some water-level recorders in the WMA.

Q And I believe Mr. Raible discussed some [Page 3036] output from the Super Model. Did you also use that?

A Yes. We also, about a year after we started or two years after we started we obtained the Super data.

Q Did you take any site visits to the WMA?

A Yes, I was there, I think, eight times for a total of around 13 or so days.

Q And can you describe what the purpose of those visits were?

A Well, the initial visits were just to be introduced to the site. The first visit was a general tour that was conducted by the Corps. We met Mr. Hausman on that visit, and then except for one other visit I believe Mr. Hausman was with us every time, or every other time I went to the site.

We went around and looked at areas that were described as representative of the greatest amount of damage.

Q I'll interrupt you there. When you say it was described as the areas of greatest amount of damage, described by whom?

A That was by Mr. Hausman.

Q Okay. Please continue.

A And then the later visits were to install the water-level recorders, to read them, and then to [Page 3037] remove them.

Q And we're looking at the report that you prepared?

A Yes.

Q Is this the only report that you prepared for purposes of this case?

A Yes.

Q And generally speaking, what kind of information is contained in DX-310?

A I have prepared summaries of the data in a graphical form for flow and stage at Poplar Bluff, flow and stage at Corning -- the observed flow and stage, and also the Super Model output for the period of 1993 through 2000. I also have presented a summary of historic rainfall across the basin, and then also the rainfall for '93 through 2000.

I have identified from the information provided by the Corps the periods and length of deviations and what the stages were for those deviations, and then also the results in a graphical form of the water-level recorders.

Q And generally speaking, are there professional standards that pertain to the evaluation of data of the kind that you prepared for purposes of this report?

[Page 3038]

A Well, every hydrologic project is different, but certainly unless other information is available the USGS records are considered to be the official records, and the use of those records is standard approach to looking at historical hydrologic records and analysis.

Q Is it unusual for a hydrologist to rely on computer modeling of river flows?

A Not at all. No.

Q The professional standards that you described, did you apply those for purposes of preparing your report?

A Yes.

Q And did you reach any conclusions about the hydrologic issues that related to Plaintiff's claims in this case?

A I did.

Q Are those set forth in your report?

A Yes.

MR. SHAPIRO: Your Honor, at this time we'd offer Dr. Nutter as an expert in hydrology with an emphasis in forest hydrology.

MR. GOODHART: Your Honor.

THE COURT: Yes.

MR. GOODHART: Just subject to the [Page 3039] objections we had in our motion in limine we're not going to object to the qualifications of Dr. Nutter as an expert.

THE COURT: All right, thank you, Mr. Goodhart. The Court does qualify Dr. Nutter as an

expert in hydrology but an emphasis in forest hydrology.

BY MR. GOODHART:

Q Dr. Nutter, let's turn to your table of contents in this report, which is page "i", the second page, and you've already given a short description of the type of information that's in your report. Before we get into it in any depth why don't you just go through this an explain in a little bit more detail what kind of information that's contained.

A All right. Of course, in the first section, introduction, the report objective is stated. Background information, I just wanted to be able to set the stage for what I understood of the watershed --- the wildlife management area, the area above the dam, the area of the watershed below the dam, the distances between gauges, and the watershed -- it's a habit -- the WMA, the wildlife management area, and that's outlined in the background.

[Page 3040]

Then Section 4 deals with a summary of information contained in the water control plan that was the regulating plan for Clearwater Dam, and then I identified from the information provided by the Corps the deviations that were identified for each of those years; had a summary, and then I also then have a section on summarizing rainfall over the basin.

The next section is just dealing with my understanding. I wanted to be able to put down what my understanding was of the management of the

water on the WMA. And then Section 6 deals with the output and comparison of the Super Model output and the gauge data for both Poplar Bluff and Corning, and then Section 7 deals with the water-level recorders. Section 8 deals with my observations and gleaning from the records about beaver activity on the site.

Q Okay. Let's turn to Figure 1 of your report, which is the page right after page 28, I believe.

A Yes.

Q What is depicted in Figure 1?

A This is the watershed using the downstream end of the WMA as the terminus of the watershed. So this is the topographic boundary, the drainage area.

Q It's several pages after page 28, I think, I [Page 3041] believe. I misspoke.

THE COURT: A figure rather than a table, Mr. Shapiro?

MR. SHAPIRO: That's correct, Your Honor.

THE COURT: Back into it do we have to go?

THE WITNESS: The figures are after the tables.

THE COURT: I've got it. Thank you.

BY MR. GOODHART:

Q I'm sorry. You were saying this is a graphical representation of the Black River Basin?

A Yes.

Q The total basin is close to 1,900 square miles in area. Above Clearwater Lake, in other words what would be considered to be the controlled or regulated area, regulated hydrologic area is above Clearwater Lake there, of course, and that's about almost 900 square miles, so the remainder of the basin that is what is considered to be uncontrolled or intervening flow is about 1,000 square miles.

In terms of river miles, there is about 42 miles or so distance from Clearwater Lake to Poplar Bluff, gauging station which is the regulating station for the releases from Clearwater Lake. The Corning station, although it doesn't look this far, but in [Page 3042] terms of river miles it's 65 miles from Poplar Bluff to Corning just because the river degrading within the watershed becomes very low and the river has quite a sinuosity to it, and so in river miles. Then there is 10 river miles from the Corning station to the upper end of the WMA.

Q Do you have an understanding of the amount of time it generally takes for water to travel from Clearwater Lake to any of the either Poplar Bluff or Corning or the WMA?

A Yes. Well, it varies, of course, with the flow and velocity of the flow in the channel. But generally even though it's 45 miles or so from Clearwater Lake to Poplar Bluff, it's about -- it's reported to be somewhere on the order of two to three days travel time, and then

another two to three days from Poplar Bluff to Corning, and then from Corning into say the middle or so of the WMA is another day to two days, depending again upon the flow.

Q Let's go back to page 6 of your report. You identified his previously as a discussion of the deviations from the water control plan?

A Yes.

Q And what is discussed in this particular section?

[Page 3043]

A Well, what I start out with is a discussion of -- prior to this on page 4, I point out what the water control plan the regulated stages are, and those regulated stages are 10.5 feet at Poplar Bluff during the agricultural season, which is they consider the agricultural season to be 1st of April through the 30th of November, and then the regulated stage at Poplar Bluff again of 11.5 feet during the non-agricultural season, which is from the 1st of December through the 31st of March, and those correspond approximately to 10.5 feet is approximately 3,500 cfs at Poplar Bluff and 4,000 cfs at Poplar Bluff cubic feet per second, that is, for the non-agricultural season. So that is the plan.

So there were approved deviations of the plan and I summarize those deviations for all the years in question here starting with 1993, and I verified those by going back through the record and verify what the Corps had given me.

Q Mr. Raible testified yesterday that he had provided information about the deviations. Did you rely in part on what Mr. Raible provided to you?

A And relied entirely upon it to go back and find them in the record. I didn't find any additional deviations. I had some questions at times and I would [Page 3044] call him and ask those just to clarify because sometimes a record wasn't -- it wasn't clear that it had been -- there might be a date and it was asked for but it was never indicated whether it had been approved or not, and I was just checking on those kind of things.

Q And were you able to clarify any questions you had --

A I was.

Q -- in talking to Mr. Raible?

A Excuse me. Yes, I was.

Q Okay. And do you feel confident that the deviations that are set forth in your report are the actual deviations that were approved between 1993 and 2000?

A I do.

Q Let's just look generally at Table 1 of your report. If you can just identify what that table states. This is towards the end. This is the page that's right after page 28 of your report, I believe.

A Yes. Twenty-seven in my document.

Q What information is contained at Table 1?

A Well, this is the summary of the deviations that I -- the year, when the deviation was to begin, when it ended, what the Poplar Bluff regulating stage [Page 3045] would be, and then our notes will explain why that deviation was requested or it was granted, and then the reason is, if I understood from Mr. Raible, was those are the reasons in which they internally identified for their purposes why the deviation was approved.

Q Okay. And some of them, if you look at the notes, it's a little more complicated than just a strict number that they were attempting to target at Poplar Bluff, is that right?

A Yes. When they would have -- I didn't mention this earlier but in the control of releases from Clearwater Lake, I mentioned 10.5 feet during the agricultural season and 11.5 feet during the non-agricultural season, those all were dependent upon lake levels. They had to manage the lake because it's a flood control facility. They had to manage the lake to have a certain storage by law that they had to provide.

And so if there was a large rain event that filled up the reservoir, they had to release that, so there would be times when they would go over that regulating stage. So you will see here under notes that, for instance, item number 10 in 1996, the regulating stage at Poplar Bluff from June 1 to June [Page 3046] 30 was six feet. But unless the pool was 50 percent of capacity, which the pool elevation was 544 feet, then they could release to 10.5 feet.

Q There is the pool elevation at Clearwater Lake, right?

A Pardon me?

Q The pool elevation at Clearwater Lake?

A Yes, that's the pool elevation at Clearwater Lake.

So all of these have those caveats, so to speak, in terms of adjusting that regulating stage, but except for a couple of exceptions most all of the regulating stages during the deviations were lower than what the authorized regulating stage would be in the summertime.

Q Thank you.

Let's turn to rainfall now, and while we're in the appendix of your report if you would turn several pages until you get to the figures. If you could turn to Figure 2, that might provide a good starting point to discuss rainfall.

A Yes.

Q Describe, if you could, what is depicted in Figure 2.

A Well, in order to understand the flow in a [Page 3047] watershed you need to look at the basin-wide rainfall. You can't look at just one rain gauge let's say near the area of your interest, although that has some bearing on what you see there, but when you're looking at river flow you have to look at the entire watershed.

Q Why is that?

A Because you have inputs. You can have a storm, heavy storm, let's say a summer thunderstorm on one end of the basin, and have no impact except a rise in the stage where you are down lower in the basin. So you have to consider all of this. High rainfalls in the upper reaches of the basin would impact stage down lower in the basin.

So a standard technique is to assemble all the rainfall records for all the gauges around your watershed and then there are several techniques. You just don't take an average. You take a weighted average of what that gauge represents. For instance, the gauges that are inside the basin are weighted more by the area they represent than the gauges outside the basin, and I have those weighting factors given. This was constructed using what's called the Thieson Polygon Method where you draw a polygon around each rain gauge and then the area of the basin that falls [Page 3048] within the polygon is what you weight the rain gauge record by.

So we did that for the 10 stations here that are listed. Other stations that we identified their polygon fell outside the basin so therefore they were not included.

And we did that for what's referred to as the normal rainfall period, a 30-year rainfall period, and that was from 1963 through 1992, and that's presented in one of the tables here.

Q Table 1 possibly, or Table 2, a few pages earlier.

A Table 2 is the weighting factors, how much area in acres, and then the weighting factor that was used for each of those rain gauges, and then Table -- I'm sorry -- yes, the second and third page of Table 2 are the weighted basin-wide monthly rainfall precipitation for the region.

So the average rainfall for 1963 through 1992 was 39.91 inches.

Q And what page are you looking at to get that?

A I'm sorry. The second page of Table 2.

Q So it's 39.91 inches?

A That's correct.

[Page 3049]

Q On average. Okay.

A And then the next page, the third page of Table 2, is for the years 1993 through 2000, and this is certainly a much shorter period of time, but the average rainfall for that period of time was 47.45 inches weighted across the basin.

Q Let's stick with the last page of Table 2, which is the 1993 to 2000 years.

A Yes.

Q Were there any years that you determined based on this information had a particularly heavy rainfall?

A Well, all the years until 1999 and 2000 were above the long-term normal average of 39.91. In fact, 1999 had the same average as the long-term average, 39.91. But all the other average -- excuse me -- the basin-wide annual rainfalls were as much as anywhere from almost five to 14.5 or so inches above the average.

But it's also critical to look at when that rainfall occurred. If you look at the previous page, which is the long-term average, you can see that the mean rainfall in June, July, August, September is under -- it's 3.38 in June, 2.34 in July, 2.31 in August, 2.41 in September -- relatively low rainfalls [Page 3050] across the basin.

If you look at the -- just for this same period -- the average June rainfall for '93 through 2000 was 5.18

compared to 3.38 for the long-term average, and you can also look back and see that some of the earlier models. Looking at the individual years, looking at 1998, I think you mentioned that one, June had 7.55, July had 9.94, and, of course, that is excessive rainfall above, considerably above normal. Those have to result in additional releases from the reservoir.

Q And would that also increase the flows on the uncontrolled portions of the river basin?

A Yes. On the intervening flows what we -- when we refer to -- Mr. Raible referred to intervening flow. That would be the flow between Clearwater Lake and Poplar Bluff that's input to this channel that you can measure, and that flow comes into the channel at Poplar Bluff. Then the flow that comes in between Poplar Bluff and Corning, that intervening area, and you can then by knowing what the differences in the flows were at the two gauges you can tell what that intervening flow volume was.

Q Let's turn back to page 12 of your report, and there is a discussion there about the WMA [Page 3051] operation.

A Yes.

Q What was the purpose of including this information in your report?

A Well, we had asked through interrogatories or I had made requests to the attorneys and through interrogatories, this is the information summarized that we received back in those responses. I wanted to include this because I wasn't sure the other experts on

our team had this information because I was dealing with the hydrology I wanted to make sure that was understood, and I wanted to make sure that I understood it as well.

The second page, I've actually just taken as a quote the description that the Plaintiffs provided in terms of how the various water control structures on the GTRs are operated to fill or flood, and then to drain. Then at the bottom of page 13 I have a table which they also provided of each year of this period in question of when they started flooding and when they started to drain the WMA.

Q And the information that is contained in that bottom table, where did that come from?

A That came from the Plaintiffs.

Q Okay. From a discovery response?

[Page 3052]

A Pardon me?

Q Was it from a discovery response?

A Yes. Well, I think it was an interrogatory response, yes.

Q Okay. I'm going to direct your attention Defendant's Exhibit 330. Wait a second, hold on. It's not 330. I've got the wrong number. Defendant's Exhibit 328.

(The document referred to was marked for identification as Defendant's Exhibit No. 328.)

BY MR. SHAPIRO:

Q Mr. Nutter, if you would turn to page 5 of this document, there is some information listed there.

A Yes.

Q Do you recognize that document?

A Yes.

Q What do you understand this to be?

A The overall document is the response to interrogatories, and this is a table of what is referred to as watering, which means flooding of the GTRs. For instance, in 1993, initiated on September 27th and de-watered on February 4th.

Q Is this the information you then relied upon for purposes of your report?

[Page 3053]

A Yes.

MR. SHAPIRO: Your Honor, I move the admission of Defendant's Exhibit 328.

MR. GOODHART: No objection, Your Honor.

THE COURT: Admitted.

(The document referred to, previously identified as Defendant's Exhibit No. 328, was received in evidence.)

BY MR. SHAPIRO:

Q Dr. Nutter, on page 14 there is a discussion of Corning stage elevations and flooding of the GTRs.

A Yes.

Q What is contained in this section?

A Well, as we've heard throughout testimony this past week and a half or so, and there was lots of discussion about at just what elevation did the GTRs and the WMA begin to flood, and I could not find any specific data that identified that. There were various memos and discussions that we'd had with WMA people in the field that it was five to six feet, and I had -- going through the records, I had determined that that range and I selected for my analysis 5.5 feet at stage at Corning in which the WMA would begin to flood, but I know that that's -- and this was all [Page 3054] pointed out, and I agree that there is a number of different elevations that it will flood.

The GTRs are one thing and, of course, the WMA with backflow through sloughs and everything else, those are going to be at different elevations that it would flood.

But because the focus was on the gauge at Corning to do an analysis, I just selected the 5.5 food height, but recognizing that it does vary, and we've heard that same testimony this week.

Q Do you feel 100 percent confident that it really is 5.5 feet?

A No. No, it's a range.

Q And if it wasn't exactly 5.5 feet, would that make a difference to your analysis?

A Well, there is a lack of specific elevational information within WMA, and each of the -- one thing is the way the GTRs, as I understand it, generally are flooded, let's say to start the fall season, is that water is diverted from the Little River into the Upper Island, and it was never determined exactly what stage that was necessary in order for that to be flooded because they can block off the flow in the Little River and divert the water in. So that's one issue is what elevation is [Page 3055] necessary to flood the GTRs, which was never identified.

The other is what elevation or what stage is the river when it backs up into the flood plain outside the GTRs, and then also if it gets high enough it would flood over the levies or through open culverts and control structures back into the WMA or into the GTR, excuse me. So there is a range but I used 5.5 feet to draw some general conclusions with respect to my water-level recorders I had placed into the area.

Q Okay. Is it fair to say that the 5.5 foot stage at Corning was an assumption for purposes of your report or was that actually an opinion that you reached?

A It was an assumption.

Q Okay.

A Based upon the best information I had available.

Q There is two documents that are listed here on page 14 that you relied upon. Did you also rely upon other documents in the record?

A I tried, I tried --

Q For the basis of that assumption.

A Pardon me?

[Page 3056]

Q For the basis of that assumption, did you rely on other documents or other sources of information?

A I tried to list all the documents here that I found to discuss that, but I also -- there were discussions particularly with Mr. Hausman in the field, and he would say five feet, five to six feet was the time it flooded.

Q And the testimony that you've heard as you've been watching the trial, would it support your assumption that it's somewhere around -- I think you said 4.5 to six feet?

A Yes.

Q Let's talk about the Super Model which is page 15. You were present for Mr. Raible's discussion yesterday?

A Yes, I was.

Q Describe, if you could, what's contained in Section 6.

A Well, the first section is just a discussion, brief discussion of how we handled the data, where we got the data, the stream flow data, and I think it would be worthwhile to point out that at the gauging stations at Poplar Bluff and Corning stage is recorded by the USGS. The USGS then uses a rating [Page 3057] curve. A rating curve is a plot of stage versus discharge to convert that stage reading to a discharge, and they publish this in their general records.

In this particular case the Corps of Engineers had retained or had obtained, because they would use this for their modeling and regulation of the river, they had also on their records the stage data. You can go to USGS and request that stage data, but you have to go into their archives to get it. The Corps had that data.

So we used the stage data provided by the Corps to us, and then they also had the flow records, and we compared those flow records between what the Corps had and what the USGS had and, of course, they were exactly the same. So we had those two records, stage and flow, and those are average daily flows.

And then we received the output from the Super Model in the form of average daily flow and we used the same rating curves that had been used at -- when we got the flows for actually at Poplar Bluff and at Corning, and we used the same rating curve that had been used in the original conversion of stage to flow to convert from super flow back to stage, because stage is what we were primarily interested in but we [Page

3058] also wanted to look at flow for comparison of how the model was comparing to the actual flows.

The second section is just a description of that Super Model, and then from there I go into the discussion of the deviations.

Q Yesterday Mr. Raible testified that he or someone from his office had provided the Super Model output data in November of 2007?

A Yes. In November, just before Thanksgiving I think it was, we had a meeting of all the experts, so it was right after the Plaintiffs had submitted their expert reports, and we recognized that there was no comparison of the flows for the non-deviated and the deviated flow. Of course, the observed flows, when there was a deviation, those would be during the deviation period. We had no way of comparing what those flows would have been for the -- if there hadn't been a deviation, the non-deviation flow.

Q Did you think that was important for purposes of your analysis?

A Well, it had been a stumbling point for me and I had been looking at various approaches to try to simulate what those flows might be, and then through conversations with the Corps there was a period of time we did nothing because we were waiting for a new [Page 3059] attorney to be assigned, and you came on the scene. So then we made contact with the Corps and eventually we received the super data within -- well, the first set of data we got was the wrong watershed, I believe. We were called within the same day we received electronically and said, no, that's not

the right data. Within a few days we received the correct data for Corning and Poplar Bluff on the Black River, and then I had various conversations with Mr. Raible to make sure that I understood what the data were that I had.

Q What level of confidence do you have, Dr. Nutter, in Super Model's ability to simulate river flows under different reservoir operating parameters?

A Well, it's a different kind of model than we might generally think of a hydrologic model. Most hydrologic models are designed to fill in or create flow information or stage for areas where there aren't any recorded data. So you're simulating or you're predicting into the future for planning or whatever it may be.

But the Super Model is different. It actually operate on observed flows, and I think there was a little bit of a confusion yesterday about exactly how it operates. The Corps, and I can just [Page 3060] describe how it might go downstream, how the flows may have, but the Corps knows how much water they discharge from Poplar Bluff -- I mean, excuse me, from the Clearwater Dam, so many cubic feet per second, and downstream at Poplar Bluff then they measure that. They, first of all, route -- there is a term in hydrolic modeling called routing where you have a flow at one point and then you route that down the channel, the hydrogaph down the channel to the next point.

And the method that the Super Model uses is the Muskingum Method, which was developed back in the, I think, the forties, on the Muskingum River in Ohio.

It's widely, widely used. It's a very simple but it's very reliable, well tested, it's used all over the world actually.

So the Muskingum Method then is used to route the water down to Poplar Bluff. They then know what that elevation would be at the gauge at Poplar Bluff from that routing model.

Q Based just solely on releases from Clearwater?

A Just solely on the releases from Clearwater. They know what that would have caused. Then they know what the actual stage is at Poplar Bluff, so that would be the inflow from intervening areas, so that's [Page 3061] added to it. So it's a model that is building upon existing data. It's not predicting into the future.

And then that flow is routed down the channel to Corning. Mr. Raible referred to these as control points. Poplar Bluff serves as a control point for the model, but it is also the gauge which is the regulating gauge for operation of the dam, the releases from the dam.

So it goes down to Corning. They have routed it down, and they have the hydrograph now. Hydrograph as it moves down, well, let's say a wave of flow going down a channel tends to flatten out. The peak becomes lower and the base of this flow hydrograph becomes longer. It's line a sinusoidal wave, but the amplitude is reduced and so forth.

So then at Corning they know how much that flow would be. They add in the additional flow from intervening area, and then they route that down to Pocahantas, which is their next control point. I don't

think this is an exact description, but it's kind of a self-calibrated model because you're using actual flows to just move things down.

So the Muskingum routing equation is the primary equation. There are no rainfall run-off models are used, no correlations that are used. It's [Page 3062] actual measured flows. So the Corps refers to it as a forecast model, but I always think of forecasting as looking into the future, but it's actually taking data that has already been measured and then using that in their regulatory, excuse me, their reservoir regulation problem. It's used as a planning tool primarily.

My understanding was that sometime, and I don't know exactly when, in 2007, I think, Mr. Raible said that this was done for -- the Super Model was run for a planning purpose outside of this case, because I had asked for any modeling results in my earlier inquiries to the Corps, and they said there weren't any. Of course, there is different people that asked, but my understanding of what Mr. Raible said yesterday was the understanding I had all along, that this model had been run not for the purpose of this case but had been run for a planning exercise, but it was valuable to us in evaluating what those deviations -- the impact those deviations had on the flows.

Q And my question was what level of confidence do you have, and you were talking about how it's self-calibrating. Are there any other --

A Right. I forgot your question. I had a great deal of confidence, and if you look at -- if you [Page 3063]

want to do that now, I can point out. If you look at perhaps Figure 5, which is for 1993.

Q It's Figure 5 of your report?

A Yes.

Q Okay.

A This is the predicted and observed discharge on the stage at Poplar Bluff. The top graph is flow and the bottom graph is stage, and if we look at the early --

Q Before you describe it, just so the record is clear there are two different colors, red and it looks like blue?

A Yes.

Q What's the red?

A Okay, the blue is the recorded discharge or I should say reported discharge, and the red --

Q Label that as OBS, is that observed discharge?

A Yes.

Q Okay.

A Correct. And then the red line is the Super Model discharge.

Q And in this context then what would that Super Discharge represent?

A It would represent the discharge, and in [Page 3064] this particular case up until October there were no deviations, so this is the correspondence between observed and Super Model flow forecast, using the Corps' terminology "forecast".

And if you look at it, and when I first looked at these I said, this is -- from my experience with hydrologic modeling this is pretty remarkable because when you're doing a simulation model where you have an awful lot of information to put in that -- and then you have to calibrate those models, this is a sort of self-calibrating model because you're using already existing information.

I will point out that if you look around April 1st or 2nd you will see a gap. There was a gap in the record from the USGS, but yet they still went ahead and forecast what the super flow would have been.

Q And so when I look at this the Super Model does not exactly track the observed stage.

A No.

Q So it's not 100 percent accurate, is it?

A No. But I would say that in the context of what's expected from hydrologic modeling, this is a very reliable and more accurate than simulation models that do not have gauge data to be self-calibrated, so [Page 3065] to speak.

Q In your experience with computer modeling, the results that you're seeing here in 1993, how does that compare with the other computer simulations that

you've seen or worked with in terms of ability to accurately estimate river flows?

A This is far better than what you would typically expect.

Now, if I had a model and I will say predicting flows into the future at Poplar Bluff, which is a typical thing that you would do with a hydrologic model, I would have to calibrate that model let's say to Poplar Bluff, but frequently the modeling is done because you don't have any recorded data, so then you don't really have any way of really checking what it truly would be in the way of calibrating.

Q We looked yesterday with Dr. Overton's analysis in a report at a deviation, a very short deviation that occurred in July of 1993?

A Yes. I have that listed in my table, but it doesn't show up on here because it was a request for two or three days of increased flow for a river festival along the river, and that was the one that I, although had been requested, I could never verify that it had been actually implemented, and so it doesn't [Page 3066] show on the graph.

Q Okay. Before we leave this page here, there are some vertical lines drawn on the bottom portion of this graph.

A Yes.

Q And what do those represent?

A That represents the approved deviation and the two vertical lines represent the period of time that the deviation was requested or approved, and then the horizontal line represents what that deviation would be.

Q So in this particular circumstance for 1993 --

A Excuse me. What the target was. I'm sorry. I couldn't find the word. What the target of the deviation was.

Q Thanks.

A I'm sorry.

Q So in this particular instance, in 1993, based on this information how would you interpret what's happening in terms of the Super Model output versus the observed output during that deviated period?

A Well, going back to Table 1, the deviation was to begin on September 29th and continued to [Page 3067] December 15th, and the target stage was six feet. Now the regulated water control plan called for in this period of time 11.5 feet because it's in the non-agricultural -- well, no. Excuse me. It's 10.5 feet until the end of November and then the 11.5 feet after that in December.

So the target stage was six feet. But unless the pool was at more than 50 percent, and then they would have to go up to the 10.5 feet, which was still a foot below the regulated stage for December.

So the horizontal line shows what their target was, and the red line shows what there would have been had there been no deviation.

Q And you have similar figures for the next several pages. Why don't we look at one more. Figure 6?

A All right. That's 1994.

Q Right. And what is this depicting?

A This is again the same data. The solid black line on the upper graph is the flow in cubic feet per second, and the red line is what the flow would have been without deviation. The bottom graph is the same thing for stage, and there the vertical lines are for the deviation starting in April 1st and continuing until November 30th, and going back to [Page 3068] Table 1 for 1994, the target stage for April 15th to May 14th was eight feet. Then from May 15th to November 30th was six feet at Poplar Bluff.

Q And so would that explain why it's not a horizontal line instead of sort of a step down because there were different --

A Yes, it steps down. That's correct.

Q Because there were different targets for that particular year?

A That's correct.

Q Okay. And we're looking now at Poplar Bluff data, is that right?

A Yes.

Q Okay. Now, I believe you've already said this but when you got the Super output, I believe Mr. Raible and you have testified, that was in flow, not in --

A That was in flow. Then we used the rating curve, the same rating curve that was used to convert the observed stage to flow, we used that same rating curve to convert flow to stage.

Q Now, is using rating curves, is that something that is a standard procedure for hydrologists?

A Yes, absolutely. These are curves that are [Page 3069] published by the Geological Survey which they use because remember they measure stage at their gauging stations, and they convert it to flow, and that's what they report, and so we used that same rating curve.

Q Then the next several pages, it's my understanding that you have all the years between 1993 and 2000?

A Yes.

Q As measured at Poplar Bluff, is that right?

A That's correct.

Q Okay. Let's look at the Corning data which I think begins at Figure 13. If you could describe what we're seeing in Figure 13.

A Well, this is the same information, the same type of information for the gauging station at Corning. The top graph is the discharge that was by Super, which is the red line, and then the observed discharge which is the black line. And again, the red line is that which would have occurred had there been no deviation, and remember in 1993 the deviation started at the end of November, as I recall, and you can see that during that period of time they retained the flow down around 6,000, between four and six thousand cfs. The flows would have been upwards of 9,000 to -- well, about 7,000 to 9,000 cfs.

[Page 3070]

So the bottom graph is the stage, and the same thing.

Q Now, unlike the Poplar Bluff graph that we just looked at, this one has a straight horizontal line across it. What does that represent?

A The straight horizontal line would be the 5.5 feet that I had selected as the average or reported, generally reported stage at which the WMAs would flood.

Q And I believe you testified that if it wasn't 5.5 feet, what would that mean for purposes of this graph?

A I'm sorry. If it wasn't 5.5 feet?

Q Right. If it was something else between --

A If we lowered it, let's say to five feet, it would just make a slight difference in perhaps either the

duration or when flooding might occur, but generally speaking the flows at Corning are on a steep rise and a steep fall, so the duration of the stage of this was relatively short. So it would move quickly between five to 5.5, or from 5.5 back down to five, or four, 4.5, whatever.

Q Okay. Let's look at 1994, which is Figure 14.

A Yes.

[Page 3071]

Q And describe, if you could, what we're seeing here in terms of the Super Model output versus the observed output.

A I go back and look at the Figure 6, which is the flow at Poplar Bluff, and it shows what the deviation target stages were. The target stages were eight feet and six feet there starting in the middle of May, starting at eight feet of the -- I'm sorry -- April. And then in the middle of May it dropped down to six feet.

And so starting with early April you can see that the flows were dropped. The super stage would have been higher because they were trying to keep it down. You can see that at Poplar Bluff as well. And then they were maintaining what their stage was, their deviation stage at Poplar Bluff across there at six feet, and it's shown on both graphs, the super stage would have been lower.

Q Okay. And so let's suppose that the flooding really did occur at approximately 5.5 feet, what would that mean in terms of being above or below that line?

Am I correct that if it's above that line that would mean there would be some flooding on the WMA in some places, and if it's below it, that it [Page 3072] would not?

A In this particular case the Super Model would have shown that the flows would have been -- let's say during June the flows would have been generally below 5.5 feet, below four feet, 4.5 feet. Then in late June the flows would have gone back up again due to -- I'd have to look at the rainfall, but probably something like rainfall that -- because we don't see that same peak occurring up at Poplar Bluff. We see a peak in the discharge there at Corning.

Q During the first day of trial, Mr. Zachary testified that about -- we don't need to look at this but it was a document called PX-270. It was an April 5, 1996, letter that he had written in which he stated that the WMA would not drain when the Black River was less than six feet at Corning. Do you recall that?

A I'm sorry. Repeat that again, the numbers.

Q This was an April 5, 1996, letter. He said that the WMA would not begin to drain until Corning was less than six feet.

A Right. Yes.

Q And then when he testified, I believe he testified as you've just stated, that what he actually meant was that it was somewhere between 4.5 and six feet.

[Page 3073]

A Yes.

Q If it were 4.5 feet it would begin to drain, what would that mean for purposes of 1994, I mean in regard to the super stage?

A Right. Well, in June, it would have -- the drainage wouldn't have started until perhaps 10 days later because we saw a dip with them. It dips to around three feet or so and then it starts to go back up again. So it would start to flood earlier.

Now, I fully would expect that at 4.5 feet some of the sloughs right off the river are going to start to flood. I don't think you can say that there is one elevation at Corning that would define everywhere on the GTRs and the flood plain that it would begin to flood or begin to drain because there is a difference in elevation from the head of the WMA, the upstream end or the downstream end, and you have this flood wave that, as I described, moving from Poplar Bluff to Corning that's still happening -- not a flood wave, but a wave moving down of stage. It's still going to be flattening out. So there is a lot of complicated factors here which is why Mr. Raible mentioned yesterday that the Corps was going to use a hydrolic model to show these flows down through the river system.

[Page 3074]

Q If Mr. Zachary though was correct that it really was 4.5 feet when the WMA started to flood, would that increase the number of days of flooding under the Super Model or would it decrease it?

A In some places on the WMA it would, yes.

Q Okay. In 1994, if you lowered that horizontal line, would that increase the number of days of inundation if it really was at 4.5 feet rather than 5.5 feet under the Super Model scenario?

A In this particular one, because you have this sort of rise and then fall again, yes, it would. But then if you look at later in July, you see that both the Super Model and the observed flow are beginning to decline rather rapidly, and it's a falling stage, and the difference in number of days there is very small.

Q Okay.

THE COURT: Mr. Shapiro, I didn't want to interrupt earlier, but there is one aspect of Dr. Nutter's testimony that is just hyper technical that the Court doesn't understand.

MR. SHAPIRO: Yes, Your Honor.

THE COURT: May I ask a quick question?

MR. SHAPIRO: Please.

THE COURT: You've referred several times to [Page 3075] a wave.

THE WITNESS: Yes.

THE COURT: And to the Court a wave is caused when essentially in hydrolic or hydrologic terms you have a pulsed discharge. That's not what the Court understands is happening from the lake.

THE WITNESS: No. Well, when I speak of a wave, I'm speaking of a hydrograph. If you think of a hydrograph being sort of a sinusoidal where it passes a point the stage begins to rise, and then it begins to fall, and that's sort of this --

THE COURT: I understand that. That very much could happen, and probably indeed does happen. It's been a long time since I studied fluid dynamics. About the time I got to equations I thought, well, I understand. But in any event, Mr. Shapiro, you look amused.

MR. SHAPIRO: No, Your Honor.

THE COURT: But I just don't understand the wave concept when we've got a constant flow from the dam. I can understand it from a modeling stance if you're modeling a given instant in time. That's all.

THE WITNESS: That's right. We speak of wave solarity, which is the speed at which this hydrograph or wave moves down a channel system. It's [Page 3076] a very dynamic thing. It's difficult to think about because you're standing in one position and you see the river rise and then it begins to fall. But if you had a series of people scattered down the river, that the velocity of that lake moving down. So when there is a discharge or let's say there is a rainfall.

THE COURT: Well, that's different because that would be not a point in time but a discrete period of time. But the Court understand -- now maybe I'm wrong, but if I'm wrong, I need to be corrected, but the Court understands that the Corps releases water from the dam at a steady rate over a 24-hour period

depending on this approved plan, and so the pulse that you talk about or the wave is really only a modeling thing. What you're not doing if you have a constant release is seeing that pulse.

THE WITNESS: Right. My understanding of the way release are made, most dams you open the gate slowly so you don't get this tidal wave, if you will, moving down.

THE COURT: It's a wave.

THE WITNESS: It's a slow rise, and then they might hold it steady for awhile, and then they slowly shut the gates and drop it down.

THE COURT: And we had earlier [Page 3077] correspondence that referred to the dampening effect.

THE WITNESS: That's right.

THE COURT: I understand that, but that was suggestive that there was really no effect in Arkansas from the releases from Clearwater Dam. That was the initial correspondence.

THE WITNESS: I wasn't making that suggestion.

THE COURT: I had some other questions, but I'm going to hold those until we get further.

MR. SHAPIRO: Thank you, Your Honor.

BY MR. SHAPIRO:

Q Let's look at Figure 15, if we could, Dr. Nutter, which is 1995.

A Yes.

Q As an expert hydrologist, how would you interpret this data?

A Let me look back at what the deviations were. This is for 1995. Look at Figure 7. We had the same deviation plan here, or similar. It is the same. Yes, it's the same as '94. So April 15th, roughly, we went to eight feet and then May 15th, we went to six feet is the regulated deviated stage.

Q But what I'm specifically interested in is based on your analysis what type of conclusion can you [Page 3078] draw about comparing these two data sets with regard to this particular year?

A I'm sorry. The two data sets?

Q How do these two graphs compare, in your opinion, in terms of the --

A Poplar Bluff and Corning?

Q No, I'm sorry. In regard to Figure 15.

A Oh.

Q How do they compare in terms of the time above or below whatever the critical data of flooding might be on the WMA?

A Well, there would have been during April, there would have been a time in which both the observed and the super flow were less than the 5.5 feet from around April 1st and almost until late in April. The super predicted the flow was about a foot less, and it's just a little above four feet it looks like, so there would be a little bit of flooding that would have occurred at the 4.5 foot level, whatever that would correspond to in the WMA.

Now as you go across the super flow falls below 5.5 feet, but not -- it goes a little bit, maybe to about five feet for just a few days in June, and then in July you have a rapid decline in river flow, a rapid decline in the stage and there is very little [Page 3079] difference there, one day or so difference between what the super elevation would have been and the observed elevation.

Q Let's look at 1996, please. Again, what conclusions can you draw based on a comparison of these two graphs in regard to the expected amount of flooding, whatever that critical stage level might be?

A There would have been -- during the growing season, there would have been very little difference except for a period in July when the observed stage was even above 5.5 feet, and the super stage would have been below 4.5 feet.

THE COURT: Mr. Shapiro.

MR. SHAPIRO: Yes, Your Honor.

THE COURT: I'm going to ask again if I could ask a question question about 1995. It's just a technical question. May I ask it?

MR. SHAPIRO: Yes.

THE COURT: I'm looking at, is it Figure 15, is that the right one?

THE WITNESS: 1995, Your Honor? Yes.

THE COURT: Why is it that from the period of about May 1 through August 1 the observed flows and the super flows are about the same, but they are substantially higher than I guess what one would [Page 3080] expect for that period. Is there something else that's affecting that?

THE WITNESS: Let me go back to my table of rainfall, and I had a series of graphs in which I plotted rainfall too, and then you just couldn't make any sense out of anything. But in Table 2, for 1995, if you look May, June and July, had considerably above normal rainfall, Table 2. May had 6.84 inches when the normal rainfall is 4.43. June had 5.31 when the normal rainfall is 3.3 inches, and June had 5.31 when the -- excuse me, I'm sorry. That was June, 3.3 for June. So there was several months there in which they had some high rainfall, May, June and July.

They retained some of that water in the reservoir apparently, and then they had to release it because of their storage requirements.

THE COURT: That's what I was going to ask.

THE WITNESS: Yes.

THE COURT: If it was in the headwaters, it would have been held --

THE WITNESS: Yes.

THE COURT: -- in the reservoir, and it would not have been discharged.

THE WITNESS: Well, they would have to discharge it sometime, but they try to not release it [Page 3081] all at once, they try to feather it out, if you will, so that --

THE COURT: That's right, but the protocol for the reservoir holding capacity -- I'm trying to find a word.

THE WITNESS: Storage capacity.

THE COURT: Yes. If the storage capacity had not been exceeded, they would just hold it until eventually in the late summer could release it.

THE WITNESS: There is a series of -- you are correct, but there is a series of elevations that they -- at different times of the year if it gets to that elevation they have to release in order to -- they have to maintain a certain storage volume at different times of the year for flood control.

THE COURT: And that's in the original approved plan.

THE WITNESS: Yes.

THE COURT: It's not in the one they tried to modify in 2000.

THE WITNESS: As far as I know, Your Honor, there was never any deviation in the actual reservoir management. It was only in the controlling stage at Poplar Bluff.

THE COURT: How can the Court check that [Page 3082] point?

THE WITNESS: Pardon me?

THE COURT: How can the Court check that point from the information that's available? I don't have any data for that.

THE WITNESS: I had reservoir elevations in the lake and we looked at those. I didn't see that they were releasing water when they shouldn't have been according to the -- one of the things that the flood control reservoir is doing is they are used for recreation in the summertime. So one of the things they are trying to do is keep the water up for recreation, so their boat ramps aren't hanging up with no water. It's a complex reservoir management issue, Your Honor.

BY MR. SHAPIRO:

Q Dr. Nutter, let's turn, I believe we're on to 1996.

A Yes. Okay, 1996.

Q My question is, as an expert hydrologist, what is your interpretation or conclusion you can draw from a comparison of the two graphs that we're seeing here, and in particular, in terms of flooding, potential flooding on the WMA?

A Well, I think that I addressed that but I'll [Page 3083] address it again.

Q Did we already do '96?

A Yes, I believe so.

Q Let's turn to '97 then.

A Okay.

Q Same question for that.

A '97, let me see what the deviation period was. The deviation period in 1997 was from basically the 1st of June to the 1st of July, and it looks like it was at six feet. So the regulating stage during the month of June was six feet, otherwise it was 10.5 feet for the rest of the growing season, or as they call it, the agricultural season.

So they were regulating, if you look back at Figure 9 for 1997, they were regulating discharges pretty much to that six foot target stage at Poplar Bluff, and the red line shows what it would have been if they were just operating under the normal plan, and that's what this shows.

Now, in terms of differences in times of flooding, in April there is a difference of perhaps -- if you're looking at 4.5 feet, there is a difference of perhaps an additional three or four days between the observed flow and the super stage. Then as you go into later in June and into July, the super stage is [Page 3084] fluctuating up and down, no doubt from rainfall and what their releases would have been.

Q Okay. Let's look at -- we've got three more to go here. Why don't we look at '98.

A '98?

Q Yes.

A Okay.

Q And the same question here, what kind of conclusions do you draw from this data in terms of possible flooding on the WMA?

A One thing, '98 was a year of very high summer rainfall. If we go back to that Table 2, you will see that there was very high summer rainfall, considerably abnormal for several months, and the deviation period in '98 was -- as shown on Figure 10 -- was at six feet from it looks like June 10th or so through the end of November. So they were attempting to regulate at six feet, but they had so much rainfall that they were releasing water and it was demonstrated here at Poplar Bluff.

Now, they were demonstrating 4.5 feet and 5.5 feet here. You would have -- the major period would be between around late August into near the end of September when the super discharge would have been lower than 4.5 feet. The actual discharge was above [Page 3085] that.

Q And you mention that 1998 was a very wet year in terms of precipitation.

A Yes.

Q I believe other witnesses have testified to that. Do you have an opinion about whether there would have been some flooding on the WMA in 1998?

A Yes.

Q And what is that opinion?

A There would have been flooding just from rainfall falling on the basin, falling in the WMA itself.

Now, there is two types of flooding. One is overbank flooding, and the other is just from direct rainfall, and there is going to be water trapped behind levies, in depressions and so forth, so that's going to happen with just direct rainfall as we refer to it.

Q Is it your opinion then that would have happened anyway due to the rainfall in 1998?

A Yes.

Q Let's look at 1999 and 2000, which I believe you referred to earlier and I just want to -- maybe we can just look at 1998 first -- excuse me, 1999 first which is Figure 19. What are you seeing here and what [Page 3086] do you find significant?

A Well, 1999 was a relatively wet year in the spring but then it was below average in the summer, and the average rainfall was the same as what it is for the long term, '63 to '92. This graph demonstrates really there is so much close correspondence during the summertime that there was none of that rainfall that would sort of introduce noise into the model, and

the model output and the observed output track each other almost exactly.

Q There were deviations in 1999, were there not?

A Yes.

Q So why in 1999 are we not seeing a difference between the super and the observed?

A Well, the deviation was for 11.5 feet from April 1st until it looks like the 15th of May, and then the regulated stage was, it looks like it was four feet. There wasn't any rainfall to even -- across the basin later in the summer to even get up to the deviated stage of four feet at Poplar Bluff.

Q Okay. So even though there was a deviation in place, is it true that what we're seeing with the super stage is basically what the Super Model would have predicted to have happened without the deviation?

[Page 3087]

A That's correct.

Q Okay. And I believe you referred to this figure earlier in terms of your confidence level in the Super Model, and could you explain what you meant by that?

A Yes. I mean, this tracks almost exactly. It sort of verifies the reliability of the model for the purposes of what it was intended.

Q Let's look at Figure 20, and same sort of question here. This appears to also track the super and observed?

A Yes.

Q Was that the same reason that you described with regard to 1999?

A Yes. I think there was one period where a rainfall was unusual. Let me check. The year 2000 was actually just about seven-tenths of an inch below -- the annual rainfall was about seven-tenths of an inch below normal, but in May and June, there was high rainfall basin-wide, 4.17 inches in May, and 6.79 inches in June, and that's reflected in those peaks that occur, and I would suggest that those are primarily -- this is in June and July -- those are primarily from intervening flow from the high rainfall.

[Page 3088]

Q And again, the super and the observed track fairly well in this year?

A Yes. Correct.

Q Okay. I think we have gone through all the years. Did you reach a conclusion or reach an opinion based on your analysis of these data that we've looked at?

A Yes.

Q And what was that?

A Generally speaking, that in terms of duration of flow during the deviation periods as defined on these graphs and in the table that I presented, that the duration of stage at Corning was extended at some times by the deviation. The frequency, there was only one event that we had determined that the frequency -- again using the 5.5 feet -- was increased. In other words, there was only one event in those years, 1993 to 2000, that the stages above 5.5 feet that wouldn't have been above 5.5 feet under normal flows.

Q And did you find the difference between -- the delta sort of between the Super Model and the observed to be a significant delta?

A There were times of some extended stages above 5.5 feet or five feet that would have been there [Page 3089] whether there had been a deviation or not just because of the amount of rainfall during those heavy rainfall months in the summertime. Other times the length of time that the stages above 5.5 feet was extended by some days, a few days, sometimes more than a few days. I have that summarized in another table for each year.

Q Okay.

A So the duration was generally increased at some times, not increased that other times.

MR. SHAPIRO: Your Honor, I'm at a good stopping point if this is an appropriate time to take our morning break.

THE COURT: Oh, I don't think so. We're only at 10 'til 10.

MR. SHAPIRO: Okay.

THE COURT: A substantial morning, but we're not that --

BY MR. SHAPIRO:

Q Let's turn to page 14 of your report, Dr. Nutter.

A Page 19?

Q And I want to turn your attention to Section 7 of your report, which is discussing water-level recorders.

A Yes.

[Page 3090]

Q This was something that was discussed a little bit on our site visit. Describe for us what's discussed here in Section 7, if you could.

A Well, I describe here where we placed the water-level recorders, why we placed them there, and then the actual description of the device, how we did it, and then a discussion of our observations and results.

Q What were the objectives in installing the water-level recorders?

A Well, we had several. One was to observe the filing, if you will, or flooding of the GTRs, and then the draining of the GTRs. Unfortunately, we weren't able to get the flooding because by the time we are approved to put these in it was already in flood stage.

The second one was to make correlations or observe how water levels change with rainfall on the WMA. Another was to look at the correlation between water levels in the GTRs and in the flood plain, if you will, the non-GTRs, with the Corning gauge, and then also wanted to look at the rate at which the water table or soil saturation responded to the water being removed from the site.

Q That last point you made, do you mean the [Page 3091] time it takes for the water to drain off of the site?

A Well, not to drain off. After surface water is gone, how long does it take the water table to drop, and our devices could go down to two feet, so we were able to measure the rate at which the water table dropped to the two foot depth.

Q You mean two feet under the surface?

A Pardon me?

Q Two feet under the surface?

A Two feet below the surface, yes.

Q Okay. There has been some discussion of piezometers in the trial so far. Are the water-level devices that you installed the same as piezometers or are they different?

A No, not really although the terms are often used interchangeably. A piezometer is an open-ended tube typically to measure energy or head, and you might -- in a shallow circumstance you might put a series of

piezometers and then you can determine which way the water is moving, up or down. So it's used more for that, to get a piezometric surface or head.

What I wanted to measure was not that but I wanted to be able to measure the height of the water above the surface, and also then the water table, and typically when you want to measure the water table, [Page 3092] and again in these shallow soils, which have layers, you have a screen which extends the entire length of your device or what the area that you want to measure, and I wanted to measure that upper two feet of soil.

So these devices were -- because we knew that duck hunters would be going through with boats and we didn't know how deep the water would get, we placed these essentially at the soil surface with a PVC well with a cap on it, and that cap had holes in it so it could measure the height of water above the surface, and then as the water declined in the water table we could measure that. So it was serving as a dual purpose.

Q And describe just very briefly, if you could, how the water-level recorders record information.

A It's a transducer. It's about four inches long. It's cigar-shaped, about a little over three-quarters of an inch in diameter, and it transfers data to what we call a shuttle or directly to a laptop computer by infrared. So you remove the device, unscrew the water-tight cap, and then you transfer the information.

I can't remember exactly, it retains something like 8,000 points. We had them out there [Page 3093] for a year -- well, almost a year, 11 months or so, and it

retained the full data set of measuring twice a day, so it was well within its range of capacity for holding data.

Q And you said it measured twice a day?

A Yes, we set them all to measure at 7:00 in the morning at 7:00 at night.

Q And what exactly was it measuring?

A It was measuring the depth of water above the surface and then as soon as the surface water was gone it was measuring the response of the water table or soil saturation within the upper two feet of the soil.

Q How many of these water-level recorders did you install?

A I've suddenly forgotten. Could I look?

Q Why don't we turn to Figure 21.

A Yes. I think it was 10 initially, and maybe 11 finally, but let me just double-check Figure 21.

Yes, this is a map showing the locations of these.

Q When you say they're showing the location, are those the yellow dots that we are seeing?

A Yes, these are the yellow dots. We placed a gauge at three locations within the river system, one [Page 3094] at the Brookings gauge, this is the staff gauge we saw on the field trip on Friday; one at the Hubbell gauge; and then we also placed one at

Schaefer's Eddy Landing on a steel post that was next to a river. Then we had one at the Upper Island GTR, the Lower Island GRT. We had two in Upper Reyno, one in Lower Reyno; one in Winchester; one over in Gar Slough; and one in Schaefer's Eddy.

Q How did you decide where to place the water-level recorders?

A Well, for the ones in the GTRs and at Schaefer's Eddy, those were locations that on several field trips that we had with Mr. Hausman he had identified these as the representative areas of the most severe damage, and so the expert team for the Defendants, we all got together in terms of what kind of information we would get there, and it would all be corresponding, so we placed those at those locations.

The Gar Slough location, I hadn't accompanied Mr. Hausman there, I had gone there on my own or several of the experts had gone there together. Mr. Hausman wasn't available. And it's a trek to get in there by walking, and we had a number of photographs and GPS readings. I also had the aerial photograph, and located a spot there that was, we [Page 3095] thought, representative, and later Mr. Hausman said that that was representative.

Q Okay. And was Mr. Hausman with you when you installed the other water-level recorders?

A Yes. He was with me for all the installations, every time we took readings, and also when we removed them.

Q And did you take GPS readings while you were there?

A I did. We had initially as we visited these sites on our initial visits, I had GPS readings, and whenever we would visit them again I would ask Mr. Hausman if this was the location. He had his GPS too, and that's how we would direct ourselves to them. We confirmed that we were in the same locations.

Q Now, this map that we're looking at, where did this map come from?

A This is a map that we obtained from the Arkansas Geographic Information Office. It's a infrared photograph. It was a series of photographs taken over a several-day period on at least two different occasions, on January 25, 2001, and February 6, 2001.

Q And is there anything beyond the fact that you can see where the water-level gauge locations are [Page 3096] located, is there anything else about this infrared photograph that you find --

A I think it's interesting to note that the -- you will note that the infrared water shows up dark, and that can be confirmed by looking at Lake Ashbaugh which is just to the lower right of Winchester, the Winchester GTR water-level gauge. Lake Ashbaugh has that same dark signature.

And if you look, the Lower Island, Upper Island, the lower part of the Upper and Lower Reyno and portions of Winchester are dark, which means that they have water on the surface. Also note that Gar

Slough also, and you can see also the rivers and all the other creeks and sloughs that have water in them appear with the same signature.

Q You just mentioned Gar Slough. The dark area that we're seeing around that water-level recorder, what is that indicative of?

A Well, that is an indication that there is water on the surface or it is extremely wet. This usually indicates there is water on the surface when you have trees there as well.

One thing I did was I checked what the river stages were during this period of time, and it ranged from 3.1 to 4.5 feet at Corning during this period of [Page 3097] time, but of interest to me was the Gar Slough area being so wet. There is a stream, and I believe this was discussed several times with Dr. Heitmeyer. I think it's called Murray Creek that comes into that area, so this is delivering water into that area from the upland side in addition to what might come at other times from the river itself in an overbank flow.

Q And where is Murray Creek? Can you see that on this map?

A You can see a -- if you go to the northwest corner of the property corner there, the furthest northwest corner, and just to the right of that there is a little squiggly line, and I believe that matches up with what shows on the USGS map as what's called Murray Creek.

Q Is it your understand that Murray Creek is an inflow of water into the Gar Slough area of the WMA?

A Yes.

Q What about Schaefer's Eddy, right next to -- you see where the water-level gauge location is in Schaefer's Eddy?

A Yes.

Q What, if anything, do you find important about this photograph?

[Page 3098]

A Well, there is a, and it's faint or not that clear on this small reproduction, but if you look at Schaefer's Eddy, and it's right near the property boundary, this is where I walked into on a field trip, and if you just look to the right of that you can see a little dark line that extends over and then onto the boundary, and that goes over towards the river. That's a slough, and I believe that Dr. Baker mentioned this. If we had gone further, and I believe I mentioned this too in my field trip though, if we had gone further, we will have been into that slough from where we had walked into the buttonbush and so forth on the field trip.

Q Okay.

THE COURT: Now, Mr. Shapiro, we have happily plugged along until we're about four minutes after 10. Any time you want to take a break between now and 10:30 is fine with the Court. It's up to you.

MR. SHAPIRO: I need to sit down. My back is killing me. So right now would be a good time.

THE COURT: Oh, I'm sorry. I didn't realize that. All right. May we take a 15-minute recess? Is that all right, Dr. Nutter?

THE WITNESS: Absolutely.

MR. SHAPIRO: Thank you, Your Honor.

[Page 3099]

THE COURT: You should have said something, Mr. Shapiro.

We're in recess.

(Whereupon, a short recess was taken.)

THE COURT: Mr. Shapiro, if you want to take a brief break or sit down or something like that, we can adjust. In fact, the Court would allow you to ask questions sitting down if that would be helpful.

MR. SHAPIRO: Thank you, Your Honor.

BY MR. SHAPIRO:

Q Dr. Nutter, we were discussing the water-level recorders before the break.

A Yes.

Q And I believe you testified about the kind of data that you were able to obtain or collect from these water-level recorders.

A Yes.

Q If you could just back up just a second and describe the process of actually installing those devices.

A Well, I'll mention to start with that we were limited because by the time we got on the site there was two and three or more feet of water on the site, so it restricted how far we could go in, but we did get to the areas that had been identified.

[Page 3100]

What we did was had weighters, and chest weighters on because of the depth of the water, and we would walk into the site and verify the location, and then auger a hole, and these wells were already prefabricated and they had a cloth sock on them to keep out silt from filling up the well. We would auger a hole and then I, fortunately, had a very adventuresome hydrologist with me, a young fellow, and he would reach down and insert these into the soil, and they were oftentimes his chin was in the water, it was deep enough, and it was November, but we did get them in.

And then once we got the well in place we would put the recording device into its shuttle on the computer and set the date and time to begin recordings; in other words, to initialize it, and we'd drop that in the hole.

Then we came back in April to read them.

Q Approximately five months later?

A This would be April of 2007.

Q Okay.

A They were put in in November of 2006, late November as I recall, and then we took them out in September of 2007.

Q What happened in the April time period?

[Page 3101]

A We just read them. We wanted to make sure that we weren't losing any data or any of them had been damaged. At this time most all the sites were free of water except for Winchester was still -- well, no, I won't say that -- there was still water on many of the sites, but Winchester was still very deep and we were unable to find it until we came back in November, and we still had a complete set of data.

I need to go back and mention that we weren't able to get into Gar Slough because we didn't have a boat that we could get up into Gar Slough. So we came back in January and installed, again with Mr. Hausman and Dr. Overton were accompanying us. We went into Gar Slough and installed the well there, so it's record is only from January, early January until November of 2007, or September of 2007.

Q And the April visit when you went back and looked at the water-level recorders in April of 2007?

A Yes.

Q Were you able to verify that the water-level recorders were gathering the data that was anticipated?

A Yes. We downloaded the data and also took measurements of the height of water where we were standing if there was water there, and verified that [Page 3102] the recording device was reading the actual water levels that we observed.

Q And then when you went back in November and retrieved the devices, were you able to verify that the water-level recorders had recorded the information that you anticipated?

A Yes. It was actually in September of 2007.

Q I'm sorry. September.

A September of 2007. Yes, we were, right.

Q At what level of confidence do you have in the data that were generated from these water-level recorders?

A I have a high degree of confidence. We've used these devices and they are very reliable. All of them worked. None of them failed.

Q I want to look at Figure 23, or excuse me, Figure 22, and I'd ask you what information is contained within this figure?

A I might add one more thing to the number that we placed. We had one of these devices that was placed in a -- actually it was Chris Hicklin from the Corps, his hunt cabin there at Brookings, and this was just another one of these devices which was setting on his window sill which recorded barometric pressure, and that we had to correct each one of the readings [Page

3103] for barometric pressure. So that was done each time.

Q And is that the standard way of using the data that are generated from the water-level recorders?

A Yes, because these are fully enclosed you have to correct for the change in barometric pressure. That does affect slightly the water levels that are measured.

THE COURT: I'm listening.

MR. SHAPIRO: Okay.

BY MR. SHAPIRO:

Q And do you feel confident that the one that you placed in Mr. Hicklin's cabin, the one that was measuring the barometric pressure, do you have a confidence that that was gathering the correct data?

A Yes. There were no gaps in the data.

Q Okay. Let's turn now to Figure 22 and if you could explain what is depicted there.

A Yes. We placed one of these gauges at -- the staff gauge at Brookings, and one at Hubbell, and the water level at Brookings at the time that we went there was roughly 267 feet, and, Your Honor, I believe that that was on the staff gauge at Brookings that we saw on the field trip on Friday. That was where there was a heavy stain which indicated the water was [Page 3104] usually there a long time.

And so this recorded the river stage at Brookings and this is the red line.

Q That's the lighter red line, is that right?

A Yes, the lighter left line.

Q Okay.

A The squiggly red line.

Q And you've got two different scales on this figure here. Which side of the scale would that --

A Right. The water-stage recorder is recorded over on the X axis on the left side of the page, and then the solid line going straight across the page is the base of the gauge, in this particular gauge it's not the base of the river bottom. It's just the base of the gauge. The gauge in on a staff or an iron post set in concrete, and it was at the base of that concrete.

Q And so for the one we're looking at, Brookings, what was the elevation of the base?

A The elevation of that was just a little over 263 feet mean sea level.

Q Okay. And so that horizontal line, does that compare with the left-hand side or the right-hand side?

A That's on the left-hand side where it says [Page 3105] "WMA stage".

Q Okay.

A Then the black squiggly line, if you will, is the Corning stage, and just for ease of comparison in this particular case the five foot elevation of the Corning stages roughly lined up with the ground of the solid line that went across, which was the base of the gauge, but there is no relationship between the two axes. They are just there for comparison purposes.

Q Okay. Does that relate to the 5.5 foot level that you had just assumed --

A Yes.

Q -- for purposes of your report?

A Yes.

Q Okay. So just sticking with Brookings, what does this data show? What do you find to be important here?

A Well, it shows that there is a great deal more fluctuation in the stage at Corning, the black line, than there is at Brookings. In other words, again I believe this is due to that damping out of the stage as it goes down the river that is represented here.

And one thing is that in this watershed, and this is represented by the sinuosity of the stream [Page 3106] channel through the WMA, when there is a high stage the water tends to spill out over the banks or up in the sloughs and so forth so there is an even greater dampening than there is further up the basin because the channels are more straight, if you will and not as much overbank flow during some parts of the year.

On the bottom of the page is a graph showing just precipitation at Pocahantas and at Corning, which are the two nearest gauges, one on either end of the WMA, just to show how there is a response to rainfall.

Q And focusing maybe on July of this year, why don't you explain, if you could, what the relationship is as depicted here with rainfall.

A Well, we see that in early July there was considerable amount of rainfall. It looks like several days of -- it looks like Pocahantas had a little over two inches and then another day of an inch or so, and Corning had something a little less, and it caused a blip, if you will, in the Corning stage, and there was another storm in mid-September that caused a blip in the Corning stage, but by this time the river, at least at Hubbell, had already fallen below where our gauge was located so it wasn't recording anything, but the July rainfall did cause the river at Brookings to come up, and you can see a little blip in the stage [Page 3107] there.

Q And with the first top Brookings graphs are located, where the Brookings line turns into a horizontal line, what does that mean?

A That horizontal line is the base of their --

A What I mean is when the Brookings line is -- this variable. When it flat-lines out, what does that mean?

A Well, the reason it flat-lines out is because we only had a -- we attached it to the staff plate, what we saw on Friday on the field trip, and the point of the

water -- the well, if you will, was sitting on the concrete base of that, and there was this much, so this means that the river was below even their ability to read it because it was below that concrete pad where this post was mounted.

Q Okay. Let's look at Figure 23 which, I believe, includes some information from these water-level recorders which were installed in one of the GTRs, or two of the GTRs.

A Yes.

Q Which GTRs are represented here?

A This is Upper Island and Lower Island and the same precipitation at the bottom.

Q One question is again you've got the same [Page 3108] type of graph here.

A Yes.

Q Is there a relationship between the WMA stage readings on the left-hand side and the Corning stage on the right-hand side?

A Yes. There are several things here that are noted. Again let me point out that the solid straight line going across the page is the ground surface elevation at the water recorder location. Look here at the Upper Island.

Q My question was though you've previously testified that there was no correlation between those two gauges. That's what I just wanted -- is that also

true for this, the relationship between the two WMA stage and the Corning stage?

A Well, I thought I testified that there was a relationship but it was dampened by the time it go in the river.

Q I'm sorry. Go ahead.

A When the river went up at Corning you would see a rise generally in the river at Brookings, but it may not be as much of a rise.

Q Okay.

A Now this is in the GTR, and we don't know exactly when the draining of the GTR occurred, but we [Page 3109] can see that the Corning stage dropped in early February and also the water level in the GTR also dropped down to -- at this location of this gauge -- to the surface of the soil.

Now this doesn't mean the GTR was empty because the GTR has a slope to it, and this happened to be on the upper -- the upstream side of the Lower Island GTR. So probably the downstream side of the GTR probably still had water in it, but I can't --

Q It's just measured at the particular point.

A Pardon me?

Q This is just the measurement at the particular point.

A That's the point I want to --

Q Okay.

A This is just at this particular point. Then the Corning stage went up, and we can still see that they tend to mimic each other in terms of when the Corning stage goes up the surface water depth would go up as well.

Q Is there any information -- I'm sorry. I didn't mean to cut you off.

A I was finished.

Q Is there any conclusion you can draw about drainage rates from this information?

[Page 3110]

A Yes. You can see that in late April the Corning stage dropped, and again my use here was five feet or so, you can see that the Corning stage dropped below five feet, and within a few days, about eight to 10 days later the surface water was gone and the red line shows a pretty steady decline down to two feet, and that took about -- at that location once the surface water was gone, it took about -- close to 18 or 20 days.

Q Okay. And when you say it hits the bottom of the -- 18 or 20 days, you're counting days until it hits the --

A That it stays. It flat-lines until there is rainfall that causes the soil water, and so this was the other thing that we could observe from this is the response of the water table to rainfall, and we had a rather significant rainfall there in July that caused the water

table to rise both -- in this particular case -- at the Upper Island and more so in the Lower Island. We saw a more rapid rise. I don't believe there was any significant overflow into the GTR from the river at that time.

Q Once the water level hit the surface water, if the water level was at the surface, did you reach an opinion on the amount of time it would generally [Page 3111] take for the water table to go down approximately two feet?

A At our locations it was anywhere from a little under three weeks to a little over three weeks.

Q And did you also reach a conclusion about the amount of time it would generally take the water table to go down to the surface after Corning dropped below five feet?

A You mean the surface water to be gone? Maybe I didn't --

Q Well, let's turn to page 20 of your report.

A Page 20.

Q In the second full paragraph it states, "Although the record does not show".

A Yes.

Q Okay. What information is contained in that paragraph?

A Oh, I follow your question now.

What we did here was to track for our various gauges, and this is only at the position of the gauge, how long it took after the Corning station was at 5.5 feet if it stayed below 5.5 feet for a length of time, how long it took for the various GTRs to drain, and remember the sequence of drainage is the Upper Island drains first typically from what we [Page 3112] understand how that's operated; Upper and Lower Reyno next, and they drain into Winchester; and then Winchester is last, and we can see that there is again different lengths of time here just because of the locations, whether they are in the higher elevation end or the lower elevation end of the GTRs, but generally we're talking anywhere from at those locations of two to 10 days, and then 11 days at the Winchester.

Q And you describe that as the amount of time it took the water level to drop just to the ground surface, right?

A Yes.

Q And then I believe you've testified that there would be an additional three or three and a half weeks for it to drop --

A Two and a half to three weeks, a little over three weeks in some places, yes, for the groundwater to drop two feet.

Q Let's turn to Figure 14, if we could, which is a figure we've already looked at, but I just want to see what that means sort of to the possible flooding of the WMA. This is 1994?

A Yes.

Q And I believe you testified that -- well, as [Page 3113] you can see in the diagram here that in June there was a period of time where the Super Model was -- the output showed that it was below the 5.5 foot sort of between June and July.

A Yes.

Q The observed was above?

A Yes.

Q So based on your analysis of the water-level recorders during that period, and then it goes back up, is that right?

A Yes.

Q So based on your analysis would all of the GTRs have drained to the surface and then drained two feet below the surface in that period of time?

A There is only about, it looks like, about a three-week span there. Some may have -- at that time the high the transformation, probably the surface water would be gone and they would have drained in most of those locations.

Again, depressions, we have to remember that there is depressions all throughout are closed depressions and they might have retained water for a long time, just lose water via evaporation and drainage through the soil, not over the surface.

Q Okay. Is there anything else about the [Page 3114] water-level records, Dr. Nutter, that you were able to reach a conclusion about?

A No, I think we've covered them.

Q Okay. You also mentioned at the beginning when we were going through the table of contents that you had looked at beaver activities at various locations on the WMA?

A Yes.

Q If you could turn to Figure 27 of this document. What is depicted in the map on Figure 27?

A Well, I've shown the location of our water-level recorders and then the series of squares or rectangles with the dots in them are locations that we had identified in the record where Scott Cagle from, I think it's Animal Nuisance Control Company, had sent reports in, and he identified by GPS every location where he had killed a beaver or trapped a beaver or broken up a lodge or a dam.

Q Let's look at those documents, if we could, just to verify that they are the same. If you could look at JX-72 which will be in the box right behind you.

MR. SHAPIRO: May I approach, Your Honor?

THE COURT: Yes.

BY MR. SHAPIRO:

[Page 3115]

Q Do you recognize those documents that are labeled JX-72? And I don't want you to go through all of them but just generally speaking do you?

A I recognize the top page, and, yes, these are the type of documents we looked at.

Q You might want to move closer to the microphone.

A Oh, I'm sorry. Yes. Yes, these are the documents we looked at.

Q Okay. And is that where you obtained the GPS coordinates for purposes of completing Figure 27?

A Yes. What we did is we had these documents on a DVD and we just searched for GPS locations. I'm not sure that we found them all, but he also had in his record locations of structures and things like that. We didn't include those; just where he had indicated that he had trapped or killed a beaver or broken a dam up or a lodge.

Q Okay. And then how did you then use that information to generate Figure 27?

A Well, we used his GPS locations and our GIS, Geographic Information Systems person. Then plotted those GPS locations on this aerial photograph.

Q Were you able to reach any conclusions based on the beaver --

[Page 3116]

A It struck me when doing this that there was -- remember, these locations were where it had been in dictated to us, represented the highest degree of damage, and I'm not trying to say that all the damage, what it is, is due to beaver, but it does indicate that beaver played a role in this because the concentrations appear in many places to be right in the locations where he found the preponderance of beaver activity.

Q Thank you.

Dr. Nutter, I want to turn your attention to page 26 of your report which are your conclusions.

A Yes.

Q Do these two pages, pages 26 and 27, summarize the conclusions that you reached in preparing your report?

A Yes.

Q And have we discussed all those conclusions here today?

A Let me just take a quick glance through.

Yes.

MR. SHAPIRO: Thank you, Dr. Nutter. I have no further questions.

THE COURT: Thank you.

Who is conducting the cross-examination.

[Page 3117]

MR. GOODHART: I am, Your Honor.

THE COURT: All right, Mr. Goodhart.

CROSS-EXAMINATION

BY MR. GOODHART:

Q Good morning, Dr. Nutter.

A Good morning.

Q Just on the last point that you were talking to Mr. Shapiro about, your Figure 27.

A Yes.

Q Those are locations where Mr. Cable concentrated his trapping activities, correct?

A I didn't see anything or don't recall seeing anything in the record that he concentrated there.

Q That's where you took from his records that he had reported activities?

A Yes, that's correct.

Q You didn't independently review the records of the Game & Fish Commission for the period of 1993 to 2000 records, for example, of Mr. Clinton Hancock, his log books on beaver control activities?

A I don't recall seeing those.

Q Okay. Did you discuss or interview Lou Hausman about his activities associated with beaver control during the 1993 to 2000 time period?

A I do recall Lou mentioning in one of our [Page 3118] visits about that there had been some beaver trapping activity. We asked that question.

Q Okay. But you didn't make any independent review of anything during the period of 1993 to 2000 with respect to beaver control, did you?

A No.

Q I thought I heard you, when Mr. Shapiro was asking you about, I think, Section 7 of your report about drainage from the GTRs, and I thought I heard you say that they would drain in sequence. Is that what you said?

A That was what was described to us, that that was generally the way they were draining; that the sequence would go from Upper Island to Reyno through Winchester, yes.

Q Were you not aware that each of the GTRs can be and are drained independently of each other?

A I was aware of that, yes. I don't know how these were drained. This is just the information that we had. I'm not saying that these indicate drain down, but we were told and our data confirmed that Winchester generally took the longest to drain.

Q Dr. Nutter, I think you had told Ms. Greathouse and myself back when we met at your deposition that you've given approximately 20 [Page 3119] depositions as an expert witness since the early 1990s. Does that sound correct?

A Sounds about right, yes.

Q Out of the number of times that you have been an expert hydrologist since the 1990s, how many times have you been engaged out of those by the United States, approximately?

A Yes, I'm thinking. Twenty years is a long time.

Q I understand.

A Most of those with have been with respect to wetland violations. I was testifying for plaintiffs.

Q I don't want to know what you testified about.

A I understand. Well, I'm thinking out loud. I'm sorry. I'll think silently for a minute.

I would say six times or so.

Q Six out of the 20 were for the United States Government?

A I think so, yes.

Q How many of those 20 times would have been with the Corps of Engineers?

A Well, when you deal with a wetland violation, the Corps is involved because usually they are the ones that identify a violation, and it goes to [Page 3120] the EPA, and then it goes to the Department of Justice. So never have I represented the Corps, but they have been a partner in these cases that I've been involved in.

Q Besides those with depositions, have you been engaged by the United States in more than six cases as a consultant?

A That's what my memory is, six. Yes, roughly six.

Q Okay. All right, thanks.

The tables that you had in your report, I believe Table 2 is the precipitation data tables.

A Yes.

Q Is that right?

A Yes.

Q You took the, I believe, pre-1993 precipitation years. You have 1963 through 1992, that's on one page, and then you have a continuation on a second page for 1993 to 2000. You understood this case was about inundation during the growing season of the year, inundation of hardwood timber, correct?

A Yes.

Q Wouldn't it have been more relevant to have focused on the precipitation that happens during the [Page 3121] growing season part of the year?

A Well, because there is a flood control regulation dam involved, there is held over water storage that has to be released later on many occasions, and so that's why we wanted to look, but I looked at growing season precipitation. This table only reports, reports it for annually.

Q Okay. In your discussions about precipitation and how you came up with the precipitation averages in this Table 2, did you take into account for the stations above Clearwater Dam, their contribution, precipitation?

A Yes.

Q Did you correct for the fact that the Clearwater Lake would retain for some time period this rainfall?

A Well, that isn't a precipitation record. That's a stream flow record. So you have to look at all the precipitation within the basin, not only what's controlled by the Clearwater Dam, but then what's uncontrolled or comes from intervening areas.

Q Okay. But still though did you take into account that some of that precipitation would have been retained in the lake for a period of time?

A In my overall analysis, I did, but it [Page 3122] wouldn't have anything to do with the overall discharge in the river.

Q All right. I had asked somebody looking at Table 2, the first summary from 1963 to 1992, I had asked someone to go to that right column, far right column on total, and to average those years' precipitation, and I notice that down at the bottom under summary for the mean or average you have 39.91.

A Yes.

Q And I'm not going to ask you to re-average that, but the person I asked to do that came up with a different number. They came up with 45.04 as the average.

A From these same data?

Q From these same data.

A I don't have an answer for that.

Q I'm going to show you just a demonstrative exhibit that I've marked as Plaintiff's Demonstrative Exhibit 24 just so you can look at it for just a minute.

(The document referred to was marked for identification as Plaintiff's Demonstrative Exhibit No. 24.)

[Page 3123]

BY MR. GOODHART:

Q And I'm not asking you again to recalculate this, and it's just going to depend -- I'm going to leave it where it just depends that we go back and can look at this, I guess, afterwards, after your testimony, but if,

Dr. Nutter, the numbers there average 45.04 instead of 39.91, wouldn't you agree that there is really not much difference between the pre-1993 years that you have and the years in the subsequent table from 1993 to 2000?

A If these are correct, and I would say so, but getting back to your earlier question the critical thing is not just the annual but also the growing season rainfall, and I believe that these numbers both -- well, you don't have for '93, but yes.

Q Okay, it wouldn't be a whole lot of difference.

A No.

Q And then, for example, you had a conclusion on page 26 of your report about that, that that conclusion would not be correct if in fact this average is 45.04, is that right? That's your Conclusion No. 6. It's no page 26.

A Conclusion No. 6?

Q Yes, sir.

[Page 3124]

A Yes, the first sentence just reads that the average was higher between '93 and 2000. Yes.

Q Okay. I just want to make sure I understood your testimony earlier about releases from Clearwater Lake and lake elevations, and I'm not sure -- the Judge had asked that. You had testified, I believe, that releases from Clearwater Lake are influenced by lake

elevations under the authorized water control plan, is that right?

A Yes, that's correct.

Q Are you aware that the only plan that regulates releases from the lake according to elevations is actually the plan in the environmental assessment or the Morris Plan that was also discussed, that those are the only plans in which lake elevations are actually considered?

A I'm not sure I follow your question. What plans are you speaking of?

Q The water control plan, the authorized plan makes reference to one lake elevation.

A Yes.

Q And that is, the lake elevation is 567.0 feet ngbd, and that elevation is an elevation at which water would be going through the spillway. That's the only elevation that is mentioned in the water control [Page 3125] plan, the authorized plan.

A I have on page 4 a summary of some of the lake elevation management goals, and there is different elevations there throughout the year, depending upon various requirements.

Q Okay. That's your understanding of the water control plan, the authorized?

A That's the authorized water control plan, yes.

Q Okay. The data that was given to you in November of 2007 that you used, the Super Model run data, you yourself didn't run that, correct?

A No. I mean, yes, that's correct.

Q You don't know the specific source code for that model, do you? I'm not talking about its methodology now, I'm just talking about the Super Model for that run that was generated, you don't know what the source code is, do you?

A No.

Q And you do not know the particular assumptions that were built into the model for that particular run, do you?

A My understanding was that the assumptions that the model is based upon were the same. All that was different was the operating conditions, with [Page 3126] deviation and without deviation.

Q You didn't go over those assumptions with either Mr. Raible or anyone else?

A He said the assumptions hadn't changed. That's what he told me.

Q One other thing. If the input for the Super Model that you -- I think you talked about it was using existing river data in the model as a part, that it was self-calibrating. Do you recall that discussion with Mr. Shapiro?

A In a sense that's what it is because you're using actual data. You're not predicting flows using actual data.

Q Since the Black River during 1993 to 2000 was being -- the deviations were occurring from the dam, the releases, then that deviated flow was part of the model input, is that right?

A Yes.

Q Okay. So wouldn't you agree that the model runs that are based on that input, that they are biased, they're biased towards the deviated flows?

A I wouldn't use the term "biased". In modeling that has a different meaning. Could you give me a context of what you mean by bias?

Q That's all right.

[Page 3127]

A Okay.

MR. GOODHART: I'm finished. Thank you. No more questions. Thank you, Dr. Nutter.

THE COURT: Mr. Shapiro, the Court has a few questions and will try to be very brief.

Dr. Nutter, you testified that you were told by Mr. Raible that the assumptions hadn't changed in the Super Model, is that correct?

THE WITNESS: The basic assumptions upon which the model was derived, yes, Your Honor.

THE COURT: Does that include what Mr. Raible described, I think, as the unrelated flows, but the hydrographs that describe the intervening flows?

THE WITNESS: Yes. The way the model determines the intervening flows is what's measured at -- let's take the Poplar Bluff. They know what the discharge was from the dam, and they know by routing that down the channel what stage that would have at Poplar Bluff. They record a stage at Poplar Bluff, and the difference is what the inflow is from the intervening flow.

THE COURT: I understand that, but I thought in constructing the model they would also essentially develop a set of intervening flows for the tributaries between say Poplar Bluff and Corning, that would also [Page 3128] an unregulated flow into the river.

THE WITNESS: That's correct, and they do the same thing in Corning.

THE COURT: Right. The Court just doesn't know whether there are irrigation draws from the river or irrigation additions, but presumably somebody would take that into account in the unregulated flow.

THE WITNESS: Well, they're not predicting the unregulated or intervening flow. They are actually measuring that. After they have routed the discharge from the dam down, they look at the difference in the flow, and whatever it is that's what it is, or the difference in stage, and that's what the difference

would be, whether there is withdrawals or additions. That additional stage is due to that intervening flow.

THE COURT: That isn't how I understood Mr. Raible's testimony at all, Dr. Nutter.

THE WITNESS: I understand, Your Honor. I didn't think he did a very good explanation, but in my discussions with him that's my understanding of it.

THE COURT: I thought actually what they did was develop a set of assumptions. They might have been based on events, whether it's rainfall or otherwise, and they built those into the model. When [Page 3129] I asked him about calibration, he then said, well, they hadn't calibrated it. To me that kind of calibration would be necessary to adjust the model.

THE WITNESS: That's why I said that in a sense it's self-calibrating because you're using real data, real-time information. You're not using projected into the future.

Now, the one place that they do have a -- for their reservoir regulation management, they do have a rainfall runoff model within the control or regulated part of the watershed which is above the dam so they can predict the flows, inflows and rate of inflows into the lake.

THE COURT: Do you have available to you PX-492? Is that somewhere up there. Well, I'll tell you what it is. It's headed "Comparison of Corning Observed, USGS 20001," and "Super Model Data, Nutter, 2008 for years 1993 through 2000".

THE WITNESS: Yes, that wasn't prepared by me but I've seen it.

THE COURT: Dr. Overton.

THE WITNESS: Yes.

THE COURT: You've seen it. Could you find it? It looks like this.

THE WITNESS: I know what it looks like.

[Page 3130]

THE COURT: You've seen it before?

THE WITNESS: I have. I had my own copy of it given to me.

THE COURT: Well, let me just ask you, and if you want to look at it, we'll find it. But basically it appears that what Dr. Overton is trying to do is compare the USGS Corning gauge level with that level that the Super Model would predict on a basis of making the adjustment for flow --

THE WITNESS: Correct.

THE COURT: -- to the gauge. Is that right?

THE WITNESS: Yes, and I did the same thing.

THE COURT: All right. Did Dr. Overton do it correctly?

THE WITNESS: I looked through it, and he used a five foot stage. In my report, I used a 5.5 foot stage, so there are some differences because of that, but it's basically the same.

THE COURT: It is the same?

THE WITNESS: Yes.

THE COURT: Just in looking at it the Court didn't get a very good correspondence on particular times between let's say it's the 2001 Corning gauge. This is all -- well, it goes back to '93 -- when I say 2001, I don't mean the actual time -- and the Super [Page 3131] Model projection. There are some days that are off by three feet, and most of the time the Corning gauge would be above that predicted by the Super Model. Once in awhile it would be the other way around, but the deviation is not so great. Did you find that?

THE WITNESS: Well, I think maybe -- well, I'll use the deviation there. Maybe we need to make a distinction between deviations, the difference between the Corning and if you look at every day.

THE COURT: Right.

THE WITNESS: There are some differences, and one of those differences comes in because of the fact that the Super Model is predicting, or I shouldn't use the word "predicting", it is giving you flow. The output is flow. You convert that to stage, and you can have a fairly broad change in flow and have a very small change in stage.

So the output from the Super Model is flow, then they convert it to stage, and so you can have sometimes those differences, but overall the differences tend to -- the pluses and the minuses tend to balance out as you expect in any modeling effort. That was my conclusion.

If you look at the number of days that the Corning gauge was about 5.5 feet as I did, or five [Page 3132] feet as Dr. Overton did, the difference in those numbers because of that are relatively small, and that's summarized in the table in my report, the number of days.

Those data there, I believe, are the same data that are on my graphs in my report.

THE COURT: That's what I wondered.

THE WITNESS: Yes.

THE COURT: Would you try one more time to explain to me the difference between your testimony and Mr. Raible's on the fact that the assumptions hadn't changed? I understand that if you had real-time data as to the Poplar Bluff gauge, and you had real-time data as to the Corning gauge, you could figure out, to the extent that the -- I've forgotten the exact conversion between flow and gauge, but if that was reasonable, you could figure out the contribution for the river between those stages, but I didn't understand Mr. Raible to be testifying that that's what happened with the model, because he's starting just with flows from the lake, and then it was rolling right on down with just the flows from the lake.

THE WITNESS: Yes, I didn't hear it fully that way, but I did see that he was a little bit -- he [Page 3133] didn't explain the system fully. I mean, I've had a number of discussions with him, and he talk about assumptions, and there are basic assumptions in the model that remain the same. Then when you run the model and the data that you input there are some perhaps assumptions there, so there is two different sets of assumptions.

When you're running the Super Model and you're saying, here, when you have a deviation, I think the assumption is that all the conditions would be the same, that the river hasn't changed and so forth, so you're using the same rating curve and everything else that was in effect at the time the observations were made.

THE COURT: All right. This is a real puzzle. I'll do the best I can.

I don't have any further questions. Well, I would note that the Court's records show that Dr. Overton's chart which Dr. Nutter has testified is basically reflective of the same data he used, Dr. Overton's chart is not in evidence. The Court would want that in evidence at some point. We don't have it in evidence now.

Mr. Shapiro?

[Page 3134]

REDIRECT EXAMINATION

BY MR. SHAPIRO:

Q Dr. Nutter, regarding Mr. Raible's testimony, do you recall him discussing what the inputs into the Super Model computer simulation would be?

A Him testifying?

Q Yes. I'm not asking you what they were, just remember him testifying.

A I believe I do.

Q As I recall his testimony, one of the inputs he discussed was what he called uncontrolled flow hydrographs?

A Yes.

Q Do you have an understanding of what those are?

A Yes.

Q What is that?

A Well, let's take Poplar Bluff, and you measure the hydrograph of Poplar Bluff, you have routed down the discharges from the dam, and that represents a certain part of that hydrograph measured at Poplar Bluff. The difference between the two hydrographs, the routed hydrograph from the dam and the measured

hydrograph at Poplar Bluff is due to the [Page 3135] unregulated or uncontrolled flow.

Q Would that be then the flow that is coming from other sources other than Clearwater Lake?

A Tributaries, irrigation, return flows, rainfall, yes.

Q And do you understand those uncontrolled flow hydrographs to be one of the inputs into the Super Model?

A Yes.

MR. SHAPIRO: Your Honor, I have no other questions, but I would move the admission of DX-310.

THE COURT: I've got another question from the questions you just asked, and I'll see what Mr. Goodhart has first.

MR. GOODHART: No further questions, Your Honor.

THE COURT: I do. The Court had understood from Mr. Raible's testimony, Dr. Nutter, that once you put in the uncontrolled flows, they stayed in. They really didn't change. You didn't have a separate measurement that you plugged into the model for the observed river stage at Poplar Bluff, Corning, Pocahantas and Black River, if I recall correctly.

That didn't change. You just put them in.

THE WITNESS: Well, you do the same, he [Page 3136] talked about the control points, and you're getting the information from the gauge the stage at each of those points, and that's another input into the model. So the model is running segments down the river basin. There's a segment from the dam to Poplar Bluff, Poplar Bluff to Corning, and so forth and you're --

THE COURT: Well, the input to the model is not just the outflow from the lake.

THE WITNESS: No.

THE COURT: It includes observed cfs all flow.

THE WITNESS: Yes.

THE COURT: At each of these four control points.

THE WITNESS: Exactly. Yes.

THE COURT: Not what the Court understood, Dr. Nutter.

THE WITNESS: I understand, but that's been my understanding all along, and I don't see how it could operate any other way with --

THE COURT: Well, it could.

THE WITNESS: I don't think it would be as -- it wouldn't suit their needs because what they are trying to do is to manage the basis-wide, and when it gets down to the White River they want to know what

[Page 3137] the flow and stages at the White River, and so they can manage the other reservoirs in concert with that.

THE COURT: We have an interesting record at this point. Mr. Shapiro, I have nothing further for Dr. Nutter.

MR. GOODHART: Just a follow up on the Court's question.

FURTHER REDIRECT

BY MR. SHAPIRO:

Q What you just described, would those be the uncontrolled flow hydrographs?

A When --

Q The flows that would be input into the Super Model?

A Well, when you measure, let's sat a Corning, what you measure at Corning is the discharge from the dam and all the uncontrolled flow that came in before Poplar Bluff and what came in between Poplar Bluff and Corning.

Q And the second part of that, those are the uncontrolled flow hydrographs?

A Yes.

Q Okay. And do you recall Mr. Raible testifying that those were indeed inputs into the Super Model?

[Page 3138]

A I do.

Q Okay. When you were talking about sort of the segmentation from control point to control point --

A Yes.

Q -- is that called routing?

A Well, you would route -- if you want to see how that has changed in terms of your modeling, you would use the routing procedure, which is, as I mentioned, the Muskingum Method, to route the water down.

Q Are you familiar with the Muskingum Method of routing?

A Yes, I am. It's very commonly used.

Q Is that a standard practice in computer simulations for rivers?

A Yes. It was even well before computers. It was done by hand. It was pretty clearly understood.

Q And is it a well accepted principle in hydrology?

A Yes.

MR. GOODHART: Your Honor, I would again move the admission of DX-310.

THE COURT: Let me ask one more question, if I may, Mr. Shapiro.

[Page 3139]

MR. SHAPIRO: Yes, Your Honor.

THE COURT: Fascinating. Dr. Nutter, where did you get the information shown on page 4 of your report, DX-310, about the regulating plan for Clearwater Lake?

THE WITNESS: As described in the beginning of the second paragraph, it is straight from the 1950 approved regulating plan, what's called the water control manual or water control plan. That's where that information is from. My understanding is that it's a plan that has been in effect and what they're operating on again.

I shouldn't say "has been in effect", there have been deviations from it, but that is the controlling plan.

THE COURT: It shows a difference between stage levels, what's set out as the second paragraph on that page, and then another following third paragraph that reflects goals. Is there a difference?

THE WITNESS: These goals are for the pool elevations of the lake. The discussions of the points one and two above that in the preceding paragraph are the regulating stages of Poplar Bluff. The discharges from the dam are regulated by the stage at Poplar Bluff.

[Page 3140]

THE COURT: Mr. Shapiro, do you have anything further?

MR. SHAPIRO: If I may have just one minute, Your Honor.

(Pause.)

BY MR. SHAPIRO:

Q Dr. Nutter, in response to a question from the Court you were discussing the water control manual for Clearwater Reservoir?

A Yes.

Q I'd like to show you a copy of what's been marked as DX-322.

(The document referred to was marked for identification as Defendant's Exhibit No. 322.)

BY MR. SHAPIRO:

Q Do you recognize this document, Dr. Nutter?

A Yes, I do.

Q And what does it appear to be?

A Well, this is the reservoir regulation manual which I believe is an appendix to -- well, no, it says this is an appendix to the master reservoir regulation manual. There is also another manual that is the water control manual for the lake.

Q The title of this is "Reservoir Regulation [Page 3141] Manual for Clearwater Reservoir"?

A Correct. Yes, that's correct.

Q Does this appear to be the manual for regulating Clearwater Lake?

A Let me just refresh my memory here.

This is the manual for regulating the dam and then there is another manual that goes into the downstream, which is called the 1950 water control manual, water control plan.

Q Did you review this document in preparing your report?

A I did.

Q Would you have relied on some of the information that's contained in this document?

A Yes.

MR. GOODHART: Your Honor, I would move the admission of this Defendant's Exhibit 322.

THE COURT: What do we do about the fact that we don't have also the 1950, which is different, I guess, according to Dr. Nutter?

MR. SHAPIRO: Well, Your Honor, Dr. Nutter testified he relied on this portion of the document.

THE COURT: He did, but he also apparently relied on -- because the 1950 version, well, regulating plan is what he actually cites in his

* * *

Trial Testimony of Dr. Sammy Lee King

[Page 3343]

* * *

Q And tell me what you found related to flooding tolerance for the species most at issue in this case, nuttall and overcup oak.

A Okay. As Dr. Baker has -- you know, has also testified that it's well established the flooding gradient in bottomland hardwood forests, the different species tolerance to these. Among studies, there is often variation in terms of -- for any particular species in terms of what they will actually call it.

In other words, there is a study on the White River that has overcup's flood tolerance, saying that it can be flooded up to 41 percent of the time. Other studies say that it can be flooded up to 41 percent of the growing season, and so there is a wide range of -- I won't say a wide range. I mean, it's still relatively narrow for the individual species. Nuttall oak tends to be flooded 10 to 21 percent of the time, and so there is a lot of -- some of these [Page 3344] studies were based up -- like the study on the White River where they actually went out and calculated elevations, then also used steam flow records to determine the long-term flood frequency of that particular site.

Other studies have dealt with seedling tolerances, flooding seedlings and seeing how long the seedlings will survive. Other studies have dealt with

impoundments from dams and looking at how long the trees will survive before they begin to -- after being flooded permanently, how long does it take them to die and begin to develop.

So a lot of these are relative flood tolerances for these different species, and at times it's very difficult to predict what any individual tree will do because each one has a unique environment that it's in, it's got a unique genetic makeup, the relationships between other species, as well as the soil site relationship that it's on can affect the survival of that particular tree.

Another important thing is that with these species typically one year of growing season flooding is not -- at least for the species we are dealing with in the study-- is not going to induce mortality. When we have multiple years of this, then we can begin [Page 3345] to start seeing mortality because the effects of flooding are cumulative, and as Dr. Baker pointed out, one of the most important factors that begins to happen under these flooded -- prolonged flooded conditions is the roots begin to die, and it can begin to affect their ability to pull in nutrients, and water, and be able to photosynthesize.

And so you wind up with degradation of the tree crown, and it also can make them susceptible to drought in the future if they lose enough of those roots.

Q Can you tell me a little bit more about that relationship between flooding and drought?

A Yes. Well, in multiple cases what they have been able to show is that if you have a really wet period and then you follow by a severe drought, it can

lead to acute mortality because of the fact that the trees have lost a lot of their smaller feeder roots, whatever, and they just simply can't pull in the resources necessary to sustain them.

* * *

[Page 3358]

for this time period 1993 to 2000, in your expert opinion do you believe that these conditions could have resulted in any increase in mortality?

A These, particularly the period between '94 to '96, I think in -- we had 85 days of growing season flooding and in '94, 80 in '95, and 80 in '96, and that was a very stressful period. We also had another -- '98 and '99 were also not as extreme as those two, but it was just a period in which there was a lot of days in which the stage was greater than 5.5 feet, and this would definitely have increased the stress of the trees on the WMA and to some extent, after the three year period, could have, you know, potentially increased the mortality, background mortality some at that time, particularly for those -- for things such as willow oak which tends to be a little less tolerant of flooding than nuttall and overcup.

Q And you spoke specifically about the period of '94 through '96, but if you look all the way up through 2000, 2000 was a drought year, is that correct?

A Correct. Yeah, I mean, I think the period that we went through with the natural -- the amount of flooding that we had on the WMA, regardless of the [Page 3359] cause, whether it was natural or

whatever, followed by that drought, the time of that drought following that very wet period is very significant in my opinion in terms of the potential acuteness of the mortality at that time.

Q And can you turn now to Table 2 in your report as well, and that's on page 18? And just to make sure I understand this, Table 2 relates to the second column of Dr. Nutter's table, just the days over 5.5 feet to the deviation, is that correct?

A Correct. And I guess one slight difference is that I put the deviations between 1 of April to 31 of October, and Dr. Nutter used from, I believe, 1 of April to 30th of September, and so there is a little bit difference there, but when there was a deviation during that period in October, I tended to note that.

Q So, regardless of whether we were under the water control plan as shown by the Super Model or the deviations that occurred, do you think that the period of drought here would have had an impact?

A Yes. I mean, with the amount of flooding we had on the site was significant, and it doesn't surprise me that there would be elevated mortality following the year 2000, if not before, with some of the flooding, but I think any of the trees that were [Page 3360] really stressed from the flooding during that period would -- a lot of them would have been pushed over the edge with the drought.

Q Is it your opinion that the deviations would have had an impact on the trees in the WMA?

A Yes.

Q Do you believe it would have increased stress?

A Yes, I think it would have. The 1994, we had almost a month of addit.onal growing season flooding; '96, and this is at 5.5 feet, we had 18 days; in 1998, we had 59 days in which the stage was greater than 5.5 feet when the Super Model predicted that it would not have been.

Q Are you able to quantity what that impact would have been?

A No, and that was, you know, the problem that I think the difficult part of this issue. One is where we are in terms of predicting how any particular tree will respond to a given set of flooding events, and when you start looking at the events that occurred during the time, the preexisting conditions, some of the management issues on the GTR, but most importantly, the natural flooding events, and then with some of these deviations. Some of the deviations [Page 3361] are significant, and would have pushed the system further, but we have no idea where that threshold is because I do believe, based on my past experience and working in Texas, after two wet years and '90 and '91, over 60 percent of the willow were moderate to severely stressed, and 40 percent of the overcup.

And so I think just that '94 to '96 growing season flooding alone would have increased the stress, and so once we start combining this it becomes very difficult to parse out what would be the most significant.

When we look at the total number of days flooded or above a 5.5-foot stage between '94 and '99, when you add in the natural flooding and the deviations, I

believe I came up with a value of 497 days of growing season flooding preceding the drought. 72.8 percent of that was due to natural or predicted by the Super Model. And so, you know, the flooding that was predicted by the Super Model was very significant. The timing of some of the deviations was also significant and the extent of those. So it's really impossible to figure out where that threshold actually was. We do know that the conditions were very wet at that time, or at least there was a lot of water on the WMA and were predicted by the Super [Page 3362] Model.

Q Turning back to your report, on page 9 you talk about the Kingwood sampling design, and can you explain to me a little bit about your concerns on how that impacted your report?

A Yeah, you know, and I think we have gone around and around with this issue here. Coming in when you have a -- essentially when we're doing a historical analysis of this data, and it would have been extremely helpful to have known, even if it's a rough estimate, where would the transects that went across that particular site, we would have got a better handle on what was going on with the mortality, not necessarily the rates but in terms of what were the areas where we had that in terms of -- we had these mortality rates that were given to us, and they were highly variable. And so what was causing that variation that we were seeing we really couldn't determine that, and we could not go back out and locate those areas to even begin to try to get a handle on that, and so that was a big challenge.

And we did not have the elevation data as well on the site, and we also had to make some assumptions

such as the 5.5-foot stage in terms of when is the WMA begin to flood and what portion of the [Page 3363] WMA would be flooded under a given thing because what we can't do is relate the 5.5-foot stage to any extent of bottomland hardwoods on the site, which also complicates the prediction of how much mortality would have actually occurred under any given set of flooding regimes, stages.

Q Going back just a little bit, talking about the Kingwood data and the mortality estimates, I think you mentioned something about elevation and ridge and swales. Can you explain that to me in a little more detail?

A Ridge and swale, you know, as we've talked about here, it can be very subtle in these systems. Some places you may have a couple of feet ridges but in other places it may be a matter of inches, and on these sites as you walk across them you can continually go up, and go down through what we call a swale or a slough, it's the low-lying area, and then you would go back up onto the ridge, and of course this would affect the duration of flooding in the swales would tend to be longer, the ridges would be slightly less, then, of course, you have trees that are distributed along the edges of those ridges too, so it results in a very heterogenous environment for bottomland hardwood trees.

[Page 3364]

Q And having location-specific data would have helped you to better understand that?

A Well, and I think that, you know, the other issue was we had the preexisting data that talked about water management problems, or where you had plugs. We had numerous places where they talked about beaver dams. I think one of them said no need to do anything in this tract until, you know, the water is taken care of or whatever.

Well, we knew the stands, where those were, but we didn't know how many plots were actually put in some of those areas that had preexisting conditions. And so if those trees were already stressed prior to this wet period, some of those could have died, you know, before the deviations really even began because some of those surveys were '87 to 1990, and the trees were already showing signs of stress, and so it makes it difficult to determine how many of those plots fell in some of those stressed areas and how would that have affected the mortality rates at that time.

Q You're familiar with Kingwood's claims in this case regarding the levels of mortality in the WMA. Do you believe that the deviations could have been responsible for those levels of mortality?

A No.

* * *

[Page 3367]

* * *

Q You would agree, wouldn't you, Dr. King, that the Corps' deviations resulted in substantial additional flooding on the Black River WMA?

A Yes. I mean, there was periods of substantial flooding.

Q I believe that's even an opinion in your report, one of your conclusions on page 11, No.3?

A Correct.

Q The Corps' deviations caused flooding that covered more ground than would have been covered under the original plan, is that right?

A Can you repeat that?

Q Sure. The deviations caused flooding that covered more surface on the WMA than would have occurred -- would have been covered under the original plan?

[Page 3368]

A It flooded at a higher stage at Corning, yes.

Q And you agree that the Corps' deviations caused flooding that lasted longer than would have occurred under the original plan, correct?

A At times, yes.

Q Let's take a look at Table 4 in Dr. Nutter's report. I think you were just looking at that a moment ago. Do you have that in front of you now?

A Okay.

Q You recall we did this exercise in your deposition and I'm going to ask you to do it with me again. From the deviations in the Super Model, you would characterize the flooding in 1993 as substantial?

A Not 1993, I don't believe. I think it was 1994 that we --

Q Okay, I'm sorry. I think I just misspoke. In '94 actually you would characterize that as extreme flooding, correct?

A Correct, and I think actually in the deposition we looked at the hydrographs on the --

Q Okay, the hydrographs that are attached to Dr. Nutter's report?

A Right.

[Page 3369]

Q And I believe that's Figure 13, is that right?

A Correct. That starts 1993.

Q Okay. And in '93, looking at that hydrograph, would you characterize the flooding there as substantial or extreme?

A Not really. I mean, there was a fair amount of flooding early. Let me see here. I'm looking at this chart. I mean, there was a fair amount of flooding in the spring, up until June or above a six-foot stage.

Q And looking at '94, would you consider the flooding on the WMA as extreme in that year?

A Yes.

Q And looking at '95, you'd also classified that as extreme flooding, wouldn't you?

A Yes.

Q And in '96, that's extreme as well, correct?

A Yes.

Q And in '97, you would classify that would substantial on its own but extreme in the period, is that right?

A Right, and I mean, substantial, but definitely, you know, that period -- I mean, '97 was actually probably the driest out of those four years, [Page 3370] but by the fact that it was following that wet period would have made it, I think, more significant.

Q And looking at '98, you would consider that to be extreme flooding, correct?

A Yes.

Q And in '99, would you consider that to be substantial or extreme?

A Yeah, I think substantial was probably what -- I mean, the fact that it was also in that period I could push it -- you know, these are subjective terms, but at that time, by that period of time I think a lot of the

trees were stressed, and the fact that it, you know, was following those would potentially make it extreme.

Q So the period from '94 to '99, you would consider that an extreme flood period, is that correct? And I think you testified the year 2000 was a drought, is that right?

A Correct.

Q That increased flooding that occurred during these years we talked about, '94 to '99, occurred for extended periods during some of the hottest months, is that correct?

A Correct.

Q And that would have increased tree stress [Page 3371] because of the reduced oxygen, is that right?

A Correct.

Q Looking at page 3 of your report, Dr. King, and this is the last full sentence in the first paragraph, you cited here that extreme flood years followed by drought can be particularly lethal to bottomland hardwood trees because of the root decay and the anaerobic conditions, is that correct?

A Correct.

Q The period from '93 through '99 was an extreme flood period followed by a drought in 2000, correct?

A Correct. Really probably '94 to '99 would be the --

Q Okay. And you would also agree, wouldn't you, Dr. King, that based on what you know about the water conditions on the WMA from '94 to 2000 it is more probable than not that the flooding from those years would have caused tree mortality on the WMA?

A I mean, I think there would have been mortality on the WMA. I think the drought made that mortality acute in terms of the percentage of trees that were killed or the number of trees that were killed.

Q And you're saying the drought. Let me ask [Page 3372] my question again. Based on those flood years you just describe as extreme, based on what we know about those extreme flood years, is it more probable than not that the flooding from those extreme flood years would have caused mortality of the WMA?

A It would have killed some trees, yes.

* * *

[Page 3376]

conditions that you're aware of and you cite to some of that in your report, but you mentioned something in your testimony which was if the trees from the previous inventories, some of those could have died before --

A Right.

Q -- the deviations even began.

A Right.

Q And you don't know how many or where those are?

A Right, and the other part of that, they could have died within the -- we don't know when. The first survey by Kingwood was in 2000, and we had an extremely stressful period leading up to that, and so we do not know how many of the trees, you know, either potentially died before the deviations or were stressed and because of the chronic flooding during that period were more susceptible to mortality in the future.

Q So it's possible trees could have been stressed from previous conditions and the flooding as a result of the deviations pushed them over the edge, is that correct?

A Correct.

Q I believe your testimony was, Dr. King, that [Page 3377] you do not believe the deviations could be responsible for this level of mortality. Was that your testimony?

A Correct.

Q And I thought I had previously understood your opinion in this case to be that you thought three things were responsible for the mortality on the WMA. Do you recall that?

A I recall that, and I believe I corrected it on my deposition when I sent it back that climate was another factor, and I do believe that that was --

Q Okay. So that would be four things, and I believe --

A Right.

Q -- that the other three, if I recall correctly, were GTR management?

A Correct.

Q And preexisting conditions?

A Correct.

Q And the Corps' deviations?

A Correct.

Q And now you've added climate?

A Well, natural, by the flooding that would have occurred on the area even without the deviations.

Q You don't think that GTR management was responsible for the death of trees outside of the [Page 3378] GTRs, do you?

A No.

Q And you don't think that these preexisting conditions -- well, first of all, you've cited several on pages 6 and 7 of your report, but you don't know anything about how many acres were affected by those conditions that are stated there, do you?

A Correct.

Q And you don't know whether any trees died as a result of those conditions?

A I think a few of them may have mentioned about elevated mortality within those areas and --

Q And -- I'm sorry. Go ahead.

A But the ones that were living, I mean, if they were severely stressed, I do not know whether if they went back six months later whether those trees were alive or dead.

Q If there were trees that died, you have no idea how many as a result of that?

A Correct.

Q And you're not charging for this case. I just want to be sure that I'm clear about this. You're not being paid additional funds.

A No.

Q But you are receiving a salary still as a

* * *

PLAINTIFF'S EXHIBIT 53

AERIAL PHOTOGRAPH OF THE DAVE DONALDSON BLACK RIVER WMA

See Fold Out Exhibit

PLAINTIFF'S EXHIBIT 66

United States Department of the Interior
FISH AND WILDLIFE SERVICE
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MEMORANDUM

DATE: November 1, 1999

TO: Field Supervisor, Columbia Field Office, Columbia, MO

FROM: Field Supervisor, Arkansas Field Office, Conway, AR

SUBJECT: Review of Clearwater Lake Water Control Plan Draft Environmental Assessment

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Below are our comments on the Clearwater Lake Water Control Plan Draft Environmental Assessment (EA). We have discussed the document and the proposed Water Control Plan (WCP) with the Arkansas Game and Fish Commission (AGFC) and concur with their concerns regarding potential impacts of the proposed plan, as well as the impacts occurring from the authorized deviation to the current plan.

The AGFC has advised us that personnel from their Jonesboro office will be compiling data relating river stages at the Poplar Bluff and Corning gages with

conditions on the Dave Donaldson/Black River Wildlife Management Area. They will also be compiling and analyzing forest resources data showing damages to their timber resources resulting from the Corps' operation under the authorized deviation. The AGFC has sent a letter (copy attached) to Mr. Jim Ellis, Little Rock District, referencing their previous letter to the Corps (Appendix A, pages A-19-21 in the Draft EA) addressing their concerns.

Clearwater Lake Water Control Plan
Draft Environmental Assessment

The purposes of Clearwater Lake regulation, according to the EA, are:

- to reduce flood crests,
- to maintain releases below a level at which cleared land is flooded during the agricultural season, and
- to expedite the evacuation of flood control storage from Clearwater Lake during the non-agricultural season.

The authorized control plan allows releases, when combined with uncontrolled flow entering the Black River below Clearwater Dam, not to exceed a stage at the Poplar Bluff, Missouri gage of 11.5 feet during December 1 through March 31, and 10.5 feet from April 1 through November 30. However, the lake has been operating under an authorized deviation, as nearly as can be determined, since 1993. The deviation allows water releases to be sized such that the stage reading at the Poplar Bluff, Missouri gage does not exceed 4 feet from mid-May to the end of November. The proposed change seeks to link the target river stage to the water level in Clearwater Lake.

The Corps of Engineers, Memphis District has proposed a revision of the Clearwater Lake Black River Water Control Manual. The revision entails modifying releases from Clearwater Dam. The proposed control plan would regulate releases from Clearwater Dam to a river stage of 11.5 feet at Poplar Bluff from December until mid-May. The regulating stage at Poplar Bluff from mid-May through November the would depend on the lake level elevation.

> If lake elevation is less than or equal to 520 feet NGVD, target river stage at Poplar Bluff would be 4 feet,
> If lake elevation is between 520 feet and 528 feet, target river stage at Poplar Bluff would be 6 feet,
> If lake elevation is between 528 feet and 544 feet, target river stage at Poplar Bluff would be 8 feet,
> If lake elevation exceeds 544 feet, target river stage at Poplar Bluff would be 10.5 feet.

The project alternative (No Action) would continue with the currently authorized Water Control Manual.

The Corps of Engineers has issued an environmental assessment and a finding that the proposed action would have no significant impact on the human environment.

Comments

The EA states that the effect of Clearwater Lake releases diminishes below the Missouri/Arkansas state line because of the increased size of the watershed the river drains; consequently, impacts to the Black River and its associated floodplain forest below the state line

are inconsequential. To support this contention, the EA lists the drainage area at various points from Clearwater Lake to the river's confluence with the White River near Newport, Arkansas. However, only one major tributary creek is shown entering the Black River above the Dave Donaldson/Black River WMA in Arkansas on the map provided in the EA. The EA provides no data supporting the amount of area it says are drained along the described points. While it is certain that other creeks too small to be seen on a map of that scale enter the river above the referenced points, the fact is that the majority of tributary streams in the watershed empty into the Black River below the WMA.

The Clearwater Dam flood control project was completed in 1948. One of its purposes was to keep cleared agricultural land from flooding during the growing season. It would be interesting to see some information on the amount of land and its proximity to the river that the project was designed to protect. The EA states that during the early to mid-1970's land that normally flooded, and was generally considered "unsuitable for farming," was left dry by climatic conditions was "now devoted to crops and timber," implying that much of this land was cleared. This was common throughout the delta during this period. The EA continues, "In the late 1970's, rainfall returned to more typical amounts and the additional land being used for crops and timber (they must have produced more land for the timber portion) was once again flooded." The implication is that the project is now being directed to provide flood control to land that should have never been cleared to begin with. This issue should be addressed in the EA.

3.0 EXISTING CONDITIONS

3.1 Land Use

3.1.1 Agricultural Crops

The EA states (Page 6) that "one-half of the estimated flood losses in the Black River watershed occur between Clearwater Dam and the Missouri/Arkansas state line, with the remaining losses occurring downstream of the state line." The table following the paragraph shows damages prevented by the project from 1982-1992. The table does not indicate whether the damages are in Missouri alone or if Arkansas is included in the estimate. This should be clarified.

The time period used to illustrate damages prevented by the reservoir project is prior to the authorized deviation from the plan. The EA does not compare impacts of the originally authorized WCP with that of the authorized deviation.

3.1.2 Timber

The EA uses a 1983 soil survey to describe forest resources. It states that "Tree growth and quality tends to be good along these drainage ways (USDA, 1983)." There is nothing in the EA to indicate that this statement reflects current conditions. The Arkansas Game and Fish Commission (pages A-20 and A-21) stated that timberland on the Dave Donaldson WMA has been damaged as a result releases made under the authorized deviation to the WCP. In light of this assertion, it is reasonable to expect that timber above this reach of the river would suffer damage as well.

The Corps should collect data on forest resources along the Black River to assess its current condition.

3.6.4 Wetlands

The EA states that wetlands become more abundant approximately 10 miles upstream of the Missouri/Arkansas state line, and that the wetland type transitions from temporarily flooded to seasonally and semi-permanently flooded types. Additionally, scrub-shrub types become more abundant. Increase in the amount of this wetland type could indicate a degradation of the wetland resources resulting from increased duration flooding or saturation. This type of alteration to the hydrology causes damage to bottomland hardwoods. Increased development of scrub-shrub type wetlands would be a consequence of this degraded condition. The Corps should examine this condition more thoroughly to determine if the changes in wetland types along the river is a result of reservoir releases.

4.0 ENVIRONMENTAL CONSEQUENCES

Modeling results were used to compare lake elevations and river stages at three critical levels under the current and proposed plans. The EA states that the model used rainfall data, river stages and lake elevation data going back 50 years. It is unclear if the data used for the model included river stages, and lake elevations under the authorized deviation. Also, it is unclear if the current plan being referred to in the EA is the original authorized plan or the authorized deviation. The Corps should make this clear. Additionally, they should run the model both under the original WCP and under the authorized deviation.

4.1 Land Use

In all the subsections of 4.1, there is no way of knowing whether the "No Action" alternative is referring to conditions under the authorized Water Control Plan or the Authorized Deviation of the Water Control Plan.

4.1.2 Timber

The EA states that there will be adverse impacts to commercial timber as a result of maintaining the current water control plan. According to the Arkansas Game and Fish Commission, releases under the authorized deviation are damaging timber on the Dave Donaldson/Black River WMA. Conversely, AGFC contends that releases under the authorized WCP would not result in these damages to the timber.

The EA states that the proposed plan will result in minor beneficial impacts to commercial timber. AGFC contends that the proposed plan will continue to damage timber resources on that area. It will continue to extend the duration of higher river stages into the growing season. Though the authorized plan would result in higher flood peaks than the proposed plan, the faster releases would reduce the duration of high river stages, thus more closely approximating the river's natural hydrologic pattern. It would allow a quicker return to lower, more natural, flows and reduce damage to bottomland hardwoods caused by extended flooding.

4.6 Biological Resources

4.6.1 Vegetation

The EA states that vegetation in proximity to the Black River will be inundated less frequently under the proposed action. Under the proposed plan, the AGFC estimates that vegetation on the Dave Donaldson Black River WMA will continue to be damaged. The proposed plan will reduce the frequency of flooding, however, there is no evidence that it will reduce the duration of flooding. Damage to bottomland hardwood vegetation is more related to duration than frequency. Consequently, there will be no change in impacts to the resource under the proposed plan.

4.6.2 Wildlife

The EA asserts that the effect of the Clearwater Reservoir diminishes at approximately the Missouri/Arkansas state line, and since the Dave Donaldson/Black River Wildlife Management Area is downstream of the state line the impacts of the proposed action are expected to be inconsequential. The AGFC attributes damages to the forest resources on the Dave Donaldson/Black River WMA; including reduced growth, health, and viability of forest resources; to extended duration of inundation of the forest after implementation of the deviation to the authorized WCP. Reduced tree vigor and mortality has a negative impact on wildlife resources by diminishing seed (mast) production, increasing susceptibility of the overstory vegetation to insects and disease, and through the direct loss of habitat.

5.0 Findings

The EA states that "the proposed action, the implementation of an updated U.S. Army Corps of Engineers Clearwater Lake Water Control Plan, will not have significant impacts on the natural or cultural resources present. Therefore, a finding of no significant impact (FONSI) is made and a finding to that effect has been prepared and included as part of the Environmental Assessment."

We do not concur with that finding that the proposed plan will have no significant impact on the natural resources present. The information provided in the Environmental Assessment does not provide current and complete information on the existing resources, or impacts from releases under the authorized deviation from the Water Control Plan. We do not believe the EA supports the contention that releases from Clearwater Lake are diminished at the Missouri/Arkansas state line and have negligible impacts on the timber resources on the Dave Donaldson/Black River WMA. The Corps should determine the relationship between river stages at the Poplar Bluff, Missouri, and Corning, Arkansas gages. Additionally, the relationship between the gage reading at Corning and flooding or saturation of the adjacent floodplain forest at the Dave Donaldson/Black River WMA should be determined. After these relationships have been established, a Water Control Plan that minimizes damage to this valuable resource should be developed.

The Black River is a major tributary of the White River and contributes a significant amount of flow to the river. Changes to the WCP for Clearwater Lake has implications to the White. This is significant

because the White River is currently being studied for a proposed major navigation project, withdrawals for several agricultural irrigation projects, water allocation and minimum flow determination, as well as modification to the release schedules at several of the dams on the river and its tributaries. The White River supports wetlands recognized as being of international importance, wetlands that winter a large number of ducks, the largest remaining block of bottomland hardwood forest remaining on any Mississippi River tributary, an area vitally important to neotropical migratory birds, and tremendous aquatic resources, which include endangered freshwater mussels and fish.

The numerous projects proposed on the White River are currently being evaluated individually without consideration of the cumulative effect of all projects. Individually, any one of these projects could be done with minimal impacts to the river, though they have the potential for major environmental impacts. Cumulatively, the implications are compounded. Therefore, we recommend that a comprehensive study of the White River Basin be conducted before any action is taken on the proposed water control plan. Furthermore, we recommend the Corps return to the original authorized Water Control Plan until this study has been completed.

cc:

Scott Yaich, AGFC
Craig Uyeda, AGFC
Bob Leonard, AGFC
Tom Foti, ANHC
Barbara Keeler, EPA Region VI, Dallas, TX

Larry Mallard, White River NWR
Dennis Widner, Cache River NWR

/s/_____

PLAINTIFF'S EXHIBIT 67

Arkansas Game & Fish Commission
2 Natural Resources Drive
Little Rock, Arkansas 72205

Scott Henderson
Assistant Director

Scott Yaich
Assistant Director

Steve N. Wilson
Director

October 23, 1999

Mr. Jim Ellis
U.S. Army Corps of Engineers
Little Rock District, Planning Section
P. O. Box 867
Little Rock, AR 72203-0867

Subject: Clearwater Lake Water Control Plan, Environmental Assessment and Draft Finding of No Significant Impact

Dear Mr. Ellis:

This is in reference to a letter dated October 5, 1999 to Steven N. Wilson, Director of Arkansas Game & Fish Commission from Roger C. Hicklin, Chief of the Planning Section with the Little Rock District Corps of Engineers, which has been referred to me for reply. Comments are being requested for the Draft Environmental Assessment and Draft Finding of No Significant Impact for the Clearwater Lake Water Control Plan.

As is stated in a letter on page A-20 and A-21 of this draft (EA), our agency has significant problems with the current plan for water releases on Clearwater Lake. With this in mind, we are requesting a meeting with your agency so we can present our concerns with the proposed action.

We appreciate the opportunity to comment on this EA and if we can be of further assistance on this project, please don't hesitate to contact us.

Sincerely,

/s/_____

Robert K. Leonard, Biologist
River Basins Section

RKL/jah

PLAINTIFF'S EXHIBIT 79

RESOURCE EVALUATION AND DAMAGE APPRAISAL

FOR

ARKANSAS GAME AND FISH COMMISSION

PART II
THE DAVE DONALDSON BLACK RIVER WILDLIFE MANAGEMENT AREA

DECEMBER, 2001

[Logo]
KINGWOOD
FORESTRY SERVICES, INC.

* * *

PART II

RESOURCE EVALUATION AND DAMAGE APPRAISAL

DAVE DONALDSON/BLACK RIVER WILDLIFE MANAGEMENT AREA

ARKANSAS GAME AND FISH COMMISSION

Kingwood Forestry Services, Inc. has been requested and authorized by the Arkansas Game and Fish Commission (AGFC) to conduct a resource evaluation and damage appraisal on the Dave Donaldson/Black River Wildlife Management Area (WMA) located in Randolph, Clay, and Greene Counties, Arkansas. In January of 2001, a report was produced entitled Resource Evaluation and Damage Appraisal for Part of the Dave Donaldson/Black River Wildlife Management Area. The report addressed the cause and effect of timber damage and timber stand decline in the WMA and appraised the value of the damage on 5 selected areas having a total of 6,990 acres. Field data was collected using conventional timber inventory and appraisal methods in October, November, and December of 2000. The 6,990 acres selected for damage appraisal was identified by AGFC personnel on the basis of degree of apparent damage. Areas selected were areas where damage was most severe. The 6,990 acre area is referred to as the Part I study area.

In the process of appraisal of the damage on the selected 6,990 acres in 5 geographically separate units, it was noted that some damage of a similar nature was occurring in much of the rest of the WMA. The damage was of a lesser degree in that the rate per acre of tree

mortality and tree decline was lower than in the 6,990 acre study area. The tree damage was nevertheless present and was certainly the result of the same forces that were causing tree decline and mortality on the 6,990 acre Part I study area.

The AGFC determined that a damage appraisal was needed on the remainder of the WMA. This is the damage appraisal report for the damages in the remainder of the WMA and is referred to as Part II.

The gross area of the WMA was determined by AGFC to be 22,925 acres. Part II is intended to address the 15,935 acres of the WMA not considered in the Part I damage appraisal report which addressed the 6,990 original study area. The area addressed in Part II is referred to as the secondary appraisal unit. Parts of the secondary appraisal unit are of a sufficiently high elevation as to apparently be free of damage from flooding at this point. Other parts of the secondary appraisal unit are in permanently flooded condition with timber types well adapted to the flooding and, at this time, are not showing damage from prolonged summertime flooding.

Some parts of the secondary appraisal unit are in areas of intermediate elevation which were not normally flooded during the growing season under circumstances which existed up to about 1993. Over thousands of years, timber stands developed which were well adapted to those conditions and which, coincidently, were composed of very high quality and valuable timber. The timber was not only valuable for its merchantability, but also because it provided ideal habitat for over-wintering migratory waterfowl.

It is those intermediately positioned stands which have been damaged by the excess growing season flooding which has occurred in the past 10 years. The purpose of the Part II appraisal is to determine the value of loss resulting from the decline and death of trees in these intermediate areas of the secondary appraisal unit.

APPRAISAL-GENERAL

This is an appraisal done in accordance with the Uniform Standards of Professional Appraisal Practice. The appraisal is a limited appraisal in summary report format. The appraisal is limited in that only a part of the acreage of the WMA is addressed and, further, that only the value of damages are considered.

The appraisal is further limited in that there are qualitative losses, some of a profoundly important nature, which are beyond the scope of this appraisal. These qualitative losses not only have to do with reductions in the value of the recreational experience of the citizens of Arkansas, but also with the community benefits which accrue from the recreational use of the property for hunting. Perhaps a more significant qualitative loss has been the change in the natural ecosystem where adaptations that may take centuries in the natural state are compressed into a very short time frame where the full measure of natural responses to change cannot take place. The unique character of the bottomland hardwood stands and the scarcity of such forest land in the region exacerbate the qualitative losses.

It is a summary report in that not all supporting data is included in this report. Additional supporting data, data from individual sample plots being most notable, is available in files at the Kingwood Forestry Services, Inc. office in Monticello, Arkansas.

Value Appraised

The value appraised is 1) the loss in market value of merchantable timber and of potentially merchantable timber and, 2) the value of the loss of economic productivity of the subject timberlands. The effective date of the appraisal is November 1, 2001, the effective end of the 2001 growing season.

* * *

Using the derived unit values for the three specie groups, sawtimber values for the study areas and timber condition classes can be calculated.

While active and competitive markets for pulpwood do not exist in the area, the pulpwood does have value as growing stock and could be sold in somewhat distant markets. A value of $3.00 per ton or $9.00 per cord was selected to be a reasonable value and was assumed to be the actual pulpwood value. Table II shows the estimated pulpwood volumes and the pulpwood value calculations for the area.

DAMAGE VALUATION

Table I reflects the estimated total volume by specie group and by condition class for the 5,776 acres cruised in the Part II study. Reducing the data to

average per acre for the Part II areas, timber volume estimates are as follows:

Dead Red Oak	191.2 BF/Ac
Declining Red Oak	214.6 BF/Ac
Dead White Oak	31.5 BF/Ac
Declining White Oak	31.8 BF/Ac
Dead Miscellaneous	75.6 BF/Ac
Declining Miscellaneous	116.6 BF/Ac

Subtracting the normal background rate of .5% per year and figuring a period of 3 years, a natural mortality of 1.5% by volume can be calculated as an adjustment since the dead trees tallied in this inventory process would encompass all trees that died within the past 3 years. Trees dead longer than 3 years were not tallied as the deterioration made scaling impossible.

The background mortality that would normally be expected is then estimated as follows:

Red Oak	3,468.1 BF/Ac @ 1.5% = 52.02 BF/Ac
White Oak	1,634.7 BF/Ac @ 1.5% = 24.52 BF/Ac
Miscellaneous	1,433.8 BF/Ac @ 1.5% = 21.51 BF/Ac

Merchantable Timber Value Losses

a. Dead Timber

The dead timber is useless and beyond any possibility of economic recovery. Loss in merchantable value is the total tree merchantable value as it existed prior to

the death of the tree calculated by figuring the mortality volume less the background mortality rate multiplied by the appraised unit values. The per acre damage in the form of dead timber and the total damage attributable to dead timber for the 11,633 acres of the secondary appraisal area is as follows:

Red Oak	
Volume of Timber from Dead Trees	191.2 BF/Ac
Less Background Rate	52.0 BF/Ac
Volume Loss Due to Excessive Overflow	139.2 BF/Ac
Appraised Unit Value	$462.13/MBF
Value of Damage, Dead Red Oak	$ 64.33/Ac
Acreage Included	11,633
Total Value of Damage	**$748,350.89**
White Oak	
Volume of Timber from Dead Trees	31.5 BF/Ac
Less Background Rate	24.5 BF/Ac
Volume Loss Due to Excessive Overflow	7.0 BF/Ac
Appraised Unit Value	$266.00/MBF
Value of Damage, Dead White Oak	$1.86/Ac
Acreage Included	11,633
Total Value of Damage	**$21,637.38**
Miscellaneous	
Volume of Timber from Dead Trees	75.6 BF/Ac
Less Background Rate	21.5 BF/Ac
Volume Loss Due to Excessive Overflow	54.1 BF/Ac
Appraised Unit Value	$140.00/MBF
Value of Damage, Dead Misc. Timber	$7.57/Ac

Acreage Included	11,633
Total Value of Damage	**$88,061.81**

TOTAL VALUE OF DEAD TIMBER (ROUNDED)	**$858,000.00**

b. Declining Timber

The declining trees continue to have merchantable value, but merchantability is very significantly impaired for several reasons.

1. There are qualitative losses due to sap rot, accelerated heart rot, epicormic branching, and other defect developments.

2. The irregular distribution and, in some cases, the small total volume per acre makes salvage logging extremely inefficient and therefore prohibitively expensive.

3. There are social and political constraints associated with selling and harvesting the large total volume of timber involved over such a large area. This factor is aggravated by the fact that the trees are still alive and can appear to be reasonably healthy to people not accustomed to dealing with tree and forest health. The aggressive salvage that would be necessary to capture the rapidly diminishing volume of timber is not feasible.

In the absence of some significant and immediate change in the pattern of prolonged flooding during the growing season, the continued degradation of trees

currently classed as being in a state of deterioration is inevitable as is their ultimate death. The appraiser estimates that tree mortality for the trees classed as being in a state of deterioration will be complete within five years. Even if adequate adjustments are immediately made in the pattern of prolonged growing season flooding, the probability of full recovery of the trees classed as being in decline is small. The appraiser estimates that, in such a situation, half of the trees will continue to decline and will be dead within five years. The rest of the declining timber will recover and live a normal life span in a degraded condition with estimated loss in value of about half.

The value of trees classed as being in a state of decline is figured as follows:

Red Oak	.215 MBF/Ac @ $462.13/MBF	$ 98.82/Ac
White Oak	.032 MBF/Ac @ $266.00/MBF	$ 8.51/Ac
Gum	.117 MBF/Ac @ $140.00/MBF	$ 16.38/Ac
Total		**$123.71/Ac**

The current value loss is appraised as follows:

Full Value Loss, 50% of the timber, $123.71/Ac on 11,633 Ac	$ 719,559.22
Half Value Loss, 50% of the timber, $123.71/Ac on 11,633 Ac	$ 359.779.61
Total Value of Damage to Declining Timber (Rounded)	**$1,079,000.00**

In the absence of adequate changes in the pattern of prolonged flooding during the growing season, it is likely that all of the timber classed as being in decline

will be dead within five years and therefore would constitute a total loss of merchantable value. That would include an additional value loss of $359,779.61.

c. The Apparently Healthy Timber

Valuation of the losses associated with timber currently classed as being in an apparently healthy condition is more difficult than appraising the dead or dying timber. Some of the volume of healthy timber is composed of species adapted to survival in extremely wet situations. Bald cypress and water tupelo are examples of such species. Other species such as water hickory, willow, and overcup oak can tolerate an intermediate degree of growing season flooding and may survive the current flooding patterns in situations where they are located on slightly higher elevations.

Still other trees are located on areas having the highest elevations and will be undamaged or only slightly damaged by the current flooding patterns. It is estimated that about 50% of the timber currently classed as healthy is situated adjacent to or near other timber that has recently died or that is showing obvious signs of deterioration. It is further estimated that about 80% of the apparently healthy timber is of species that cannot tolerate prolonged flooding during the growing season. Although the timber has not currently lost merchantable value, there can be no doubt that most of the timber is at risk and will follow the deteriorating trees through degradation and ultimate death in the absence of significant and immediate change in water management.

In the event that adequate changes in growing season flooding patterns are immediately made, it is highly

probable that most of the apparently healthy timber will survive and progress through normal life cycle patterns. Certainly there will be persistent health and quality problems in the apparently healthy timber which will arise from incipient diseases currently in the trees which were triggered by excessive flooding during recent growing seasons. No estimate is made for damage to trees which currently appear to be healthy.

d. Pulpwood

The same logic and process was applied to trees of pulpwood size and is summarized in Table II.

TABLE II

PULPWOOD VOLUMES AND VALUE BY CONDITION CLASS	
Dead Pulpwood Trees	.218 Cds/Ac
Less Background Mortality	.046 Cds/Ac
Direct Volume Loss	.172 Cds/Ac
Loss on 11,633 Acres	2,001 Cds.
Value of Loss at $9/Cd.	$18,009.00
Dying Pulpwood Trees	.075 Cds/Ac
Loss on 11,633 Acres	872 Cds
75% Volume Loss	654 Cds.
Value of Loss at $9/Cd.	$5,886.00
Damage Value of Pulpwood Sized Trees (Rounded)	**$24,000.00**

Summary of Appraised Value of Losses in Merchantable Timber

Current value of losses incurred in the Part II study area as of December 1, 2001

Dead Sawtimber	$ 858,000.00
Deteriorating Sawtimber	$ 1,079,000.00
Pulpwood Size Trees	$ 24,000.00
Actual Current Loss	**$1,961,000.00**

Losses Not Appraised

At the time of this appraisal, there has been no significant loss in land value on the secondary study area or Part II areas. The timber stands and the character of the vegetation can recover a full measure of value if the growing season flooding pattern is stopped before permanent changes in soil character develop.

The degradation of a critical forest and wildlife ecosystem, the diminished aesthetic value, and the loss of recreations opportunity in the WMA are a direct and immediate result of prolonged growing season flooding. These losses in the secondary appraisal area (the Part II study area) are of relatively small importance at this time, but are potentially very significant. These elements are outside the scope of this appraisal.

The WMA area is part of a contiguous block of high quality bottomland forest having a total area of over 21,000 acres. There is no other similar tract of land within 75 miles of the WMA. The WMA provides a link in the Mississippi River Migratory Waterfowl Flyway that is of the greatest importance to the successful migration, wintering, and return of migratory waterfowl to their breeding grounds.

There were number of wetland indicator plants observed in the inventory process which indicate the early stages of change in character from a well drained bottomland hardwood forest to a true wetland ecosystem for the Part II study area. Deficiencies in the presence of oak seedling and saplings also indicate a forest in an early transition process. With a change in the water management system, this process of

transition could be reversed with no significant long term damage to the land in the Part II study area.

The widespread degradation and mortality of the trees that comprise the bottomland oak forests is a serious and progressive loss in both economic and non-economic terms. This progressive deterioration of the forest may soon reach a point where reversal of the process and restoration of the habitat will become a practical impossibility. The values appraised in this report address only the ordinary commercial aspects of timber value in timber production. While the commercial aspects are important in measuring the ordinary economic values, the environmental and social values associated with such an important and unique area are not adequately addressed by ordinary commercial considerations. To appraise the value of the total impact that growing season flooding

* * *

PLAINTIFF'S EXHIBIT 80

RESOURCE EVALUATION AND DAMAGE APPRAISAL

FOR

ARKANSAS GAME AND FISH COMMISSION

PART OF
THE DAVE DONALDSON BLACK RIVER WILDLIFE MANAGEMENT AREA

JANUARY, 2001

[Logo]
KINGWOOD
FORESTRY SERVICES, INC.

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RESOURCE EVALUATION AND DAMAGE APPRAISAL DAVE DONALDSON/BLACK RIVER WILDLIFE MANAGEMENT AREA ARKANSAS GAME AND FISH COMMISSION

EXECUTIVE SUMMARY

During November-December 2000, Kingwood Forestry Services, Inc. conducted an investigation on portions of the Dave Donaldson/Black River Wildlife Management Area (WMA). The purpose of the study was to determine if excessive tree mortality and general forest degradation was occurring on the WMA. If excessive mortality was occurring, the study would also determine the cause for the mortality. Finally, the study would provide an appraisal of dead and dying timber. A 5% timber inventory, a timber appraisal, and a resource evaluation were conducted on 5 tracts that comprised 6,990 acres or about a third of the WMA.

The result of these studies indicate that the bottomland hardwood forests within much of the WMA are in a rapid state of decline and degradation. Mortality over the last 3 years in some tree species, particularly Nutall oak, ranges from 20-60%; and crown die-back is evident in 30-60% of the living trees. Tree mortality in these areas in previous years was only 1 to 2%. In addition, vegetation and plant communities that are developing in the understory of these dying stands are comprised almost entirely of facultative wetland species that normally occur on sites along lake, pond, or slough borders where the soils remain saturated with water most of the year.

The obvious cause of the tree mortality and stand degradation is a 1993 change in the water control plan for regulating flow rates and levels of the Black River below Poplar Bluff, Missouri. The change involved a deviation in the plan to allow prolonged and restricted flows during the summer months which results in growing season flooding of hardwood forests on the WMA.

The timber appraisal indicates that the value of the damage which has already occurred in dead and dying timber on the 6,990-acre study area is $4,754,000.00. If the water control plan is not immediately changed, and growing-season flooding continues, additional damages will occur. The value of additional damages is appraised at $6,386,000.00 for the 6,990 acre area.

There are other areas within the WMA that are in a similar state of decline but not included in this study. These areas must be considered before a comprehensive damage appraisal for the entire WMA can be made. Also, non-commodity resources such as loss of critical forest ecosystem and wildlife habitat, diminished aesthetic quality, and reduced hunting and other recreational opportunities have not been evaluated. These resources have significant value and should be considered in an assessment of the total impact that growing season flooding is having on the WMA.

* * *

stoplog structures, and inverted siphons) at appropriate locations to hold and regulate water in the GTR's. In late October each year, water is diverted from Little River into the GTR's and maintained at

depths of 6 to 36 inches during migratory waterfowl season (mid-November thru mid-January). The flooded hardwood forests provide cover and food for migratory waterfowl during winter months and a public hunting area for sportsmen. Gates are opened as soon as waterfowl season closes so that impounded water can drain from the GTR's. If river levels are low enough (<6 feet at the Poplar Bluff, MO gage), the impounded water will drain from the GTR's by the end of February.

All forested stands on the WMA are inventoried periodically to determine species composition, stand structure and stocking, and vigor of the forest. Management prescriptions are developed to provide timely management activities such as thinnings and regeneration cuts that would promote improved and continued forest and wildlife habitat.

BLACK RIVER WATER CONTROL PLAN

As a part of the White River Basin flood control project, Congress authorized construction of a dam on the Black River north of Poplar Bluff, MO. The Black River is a tributary to the larger White River. The dam was completed in 1948, forming Clearwater Lake in southern Missouri. The Clearwater Lake Water Control Manual was released by the U.S. Army Corps of Engineers (USACE) in 1953 and was revised in 1995 (USACE, 1995). The initial water control plan called for releases of stored water from Clearwater Lake to be sized and timed such that those releases, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a river gage reading of 11.5 feet at Poplar Bluff, MO (the official gaging station) during the period from

December 1 through March 31, and 10.5 feet during the period April 1 through November 30 (USACE, 1995). The plan resulted in a rapid release of stored lake water each spring and short-term flooding along the Black River. The rapid release of water in the spring simulated natural flooding that had occurred along the flood plain for centuries, but at controlled rates and levels. Floodwaters generally receded by late May of each year and the hardwood forests growing in the flood plain thrived.

The authorized 1953 plan was followed until 1993, when the Corps of Engineers began operating under an "approved deviation" from the authorized plan (USACE, 2000). The deviation stipulates that water releases from Clearwater Lake will be sized and timed such that, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a river gage reading of 11.5 feet at Poplar Bluff, MO from December through mid-May, and 4 to 10.5 feet from mid-May to the end of November, depending on lake levels (USACE, 2000). The deviation involves a limited or restricted release of lake waters from mid-May through November, and often results in prolonged flooding of forest communities in the Dave Donaldson/Black River WMA. Flooding extends well into the growing season, and often, floodwaters are not drained from oak stands until mid- to late-August. As a result, soils on much of the WMA remain saturated for 10 to 11 months of the year (November – February from GTR impoundment and March – August from restricted and prolonged water release from Clearwater Lake).

Hydrographs of water levels in the Black River illustrate dramatic changes in growing season flooding

patterns and duration of flooding of forests communities on the WMA since 1993. Prior to the deviation from the authorized water control plan in 1993, flooding on the WMA was generally abated by late April or early May when water levels in the river dropped to a gage reading of 4 feet or less at Poplar Bluff (Appendix A, Figure 1). During the growing season months of June – August, river levels remained below a 4-foot gage reading and soils supporting the oak forests dried out and stands demonstrated healthy and vigorous development. In contrast, beginning in 1993 and continuing through 1998 restricted releases of water from the lake, as stipulated in the "approved deviation" from the initial water control plan, resulted in water levels and gage readings at Poplar Bluff to remain at or above 6 feet into mid- to late-July (Appendix A, Figures 2a - 2e). Since forest communities on the WMA are inundated when water levels at the Poplar Bluff gage are held at or above 4.5 to 5 feet, the oak forests remained flooded until late July or early August and soils remained saturated throughout the growing season during these five years. During the years 1999 and 2000, significant deficits in rainfall occurred in southern Missouri and northern Arkansas; growing season precipitation was >10 inches below normal each year (NCDC, 2000). The drought conditions required less water storage in Clearwater Lake, which in turn resulted in lower release rates during the growing season. Thus, river levels during the 1999 and 2000 growing seasons returned to pre-1993 levels (Appendix A, Figure 3).

An Environmental Assessment (EA) of a proposed change in the Clearwater Lake Water Control Plan was released by the USACE in February, 2000. The proposed action, as described in the assessment, was

to update the current water control plan to include the water regulation procedures of the "approved deviation" which had been used since 1993 (USACE, 2000).

The findings of the EA stated that the proposed action has the potential for significant impacts on natural or cultural resources. The findings indicated that the proposed water control plan that has been used since 1993 would result in 45 days during the growing season of a typical year having potential for extended inundation of hardwoods growing in the Dave Donaldson/Black River WMA. The findings of the EA then pointed out that the 45 days represented 25% of the growing season and represents a significant adverse impact to species composition and habitat deterioration on the WMA. As a result of these findings, the USACE concluded that a finding of no significant impact could not be supported, and that to continue with the proposed action would require the preparation of an Environmental Impact Statement (EIS).

DEGRADATION OF FOREST COMMUNITIES

Many of the oak forest communities on the Dave Donaldson/Black River WMA are in a rapid state of decline as manifested by high rates of mortality and top die-back. In an attempt to determine why some of the forest communities are degrading at such a rapid rate, six tracts were visited in early October 2000 (see map). Three of the tracts were GTR's that have been flooded each November – February since the early 1960s as wintering migratory waterfowl habitat. Two of the tracts were adjacent to the GTR's, but were areas not under GTR management, and thus only

subject to flooding when the Black River reached normal flood stage (4.5- to 6-foot gage reading at Poplar Bluff, MO). Another tract, comprised of two separate stands, was on relatively high ground and seldom floods except at extreme high river levels (7.5- to 9-foot gage reading at Poplar Bluff, MO).

* * *

Tract #5 – Shavers Eddy Area --This 492-acre tract is located west (and across the Black River) of the Winchester GTR (see map). Elevations in this tract range from 260 to 265 feet m.s.l. Like Tract #4, this tract floods only when the Black River rises to a 5- to 6-foot gage reading at Poplar Bluff. During 1994-1998, floodwaters resulting from prolonged and restricted release of Clearwater Lake water inundated this area from June until August.

The forest community on this tract consists of Nuttall oak, overcup oak, sweetgum, sycamore, and green ash. The dominant and codominant species are 70- to 80-year-old Nuttall oak. Stand basal area ranged from 70 to 80 ft^2/acre. Excessive mortality (59%) was occurring in the red oaks, while 50 to 60% die-back or mortality was evident in white oaks and gums. In openings created by dead trees, smartweed, lizard's tail, and buttonbush were developing in abundance. Buttonbush occurred on 69% of 123 sample plots taken in this tract (Appendix A, Table 1). Buttonbush plants that were 5 to 7 feet tall were 5- to 6-years-old. Little or no advance reproduction of overstory species was present.

Tract #6 – Control Stand #1 – This 150-acre stand is located in a large bend of the Black River, just across the river from the Gar Slough Area (Tract #4) and only

0.25 miles north of the Winchester GTR (Tract #3). Because of its relationship to the river bend, much of the stand is on the higher natural levee of the river than adjacent tracts. Elevations range from 265-270 feet m.s.l. The stand only floods when the Poplar Bluff gage exceeds 9 feet, thus, the delayed, restricted release of water from Clearwater Lake in 1994-1998 did not inundate this stand.

The forest cover of the stand is comprised of willow oak, cherrybark oak, swamp chestnut oak, Nuttall oak, sweetgum and hickory (Appendix A, Figure 6a). Stand basal area ranged from 80 to 90 ft^2/acre. The stand was in the 80-100 year age class and appeared to be healthy and vigorous with little mortality or die-back (<2%). Ground cover included poison ivy, and trumpet creeper. Oak, hickory, and ash advance reproduction occurred in canopy openings (Appendix A, Figure 6b).

Tract #6 – Control Stand #2 -- This 150-acre stand is located along the Black River just west of the Winchester GTR (Tract #3). Elevations are similar to those of Control Stand #1, ranging from 265 to 270 feet m.s.l. The stand only floods when the Poplar Bluff gage exceeds 7.5 to 8 feet, thus inundation did not occur in 1994-1998 with the delayed, restricted release of Clearwater Lake water.

The stand is made up of 80- to 90-year-old Nuttall oak, overcup oak, green ash, and persimmon. Stand basal area averaged ca. 150 ft^2/acre. The stand appeared to be healthy and vigorous, with mortality and/or die-back being <2%. Ground cover includes many 6-inch tall overcup oak seedlings. Cutgrass and buttonbush occurred on 13 to 20% of sample plots (Appendix A, Table 1). WMA personnel said this stand is what all

the GTR stands looked like in terms of mortality, vigor, and ground cover in 1991 (AGFC, 2000), prior to growing season flooding in 1994-1998.

General Stand Observations. – Excessive mortality was occurring in all tracts except the two control stands. Mortality in oaks and gums was ranging from 15 to 60%. Some 30 to 40% of the trees that were not dead were showing severe die-back in the crowns. Stand inventories conducted by the AGFC in the Winchester GTR (Tract #3) in 1986 and in the Gar Slough Area (Tract #4) in 1991, indicated that average mortality and/or die-back in those years was only 1.5% and 1.1%, respectively (Hausman and Zachary, 1986; AGFC, 1991). All dead or dying trees that were cored with an increment borer in October showed evidence of dead cambium and decaying sapwood. This is unusual for oaks, since they normally decay from the pith outward as a result of internal pathogens. Most dead and dying trees had evidence of active insects, particularly powder post beetles. These beetles only infest trees that are dead or dying, or under severe stress.

On all tracts except the two control stands, wetland indicator species were invading and occupying the understory, particularly underneath dead and dying trees where sunlight was sufficient. Except for the two control stands, little or no reproduction of overstory tree species were present in the understory, even in stands that had been thinned in the last 10 to 15 years for the specific purpose of promoting establishment of reproduction.

Soil moisture levels were generally lower on the high ridge and slackwater sites than the lower slough or

depression sites. This was likely related to differences in water table depths and the associated lateral and upward movement of water in the soil.

Wind-throws were common on all tracts, except the two control stands. Most wind-throws showed evidence of damaged root systems resulting from saturated soils and/or high water tables. Many root systems had prolific development of root suckers (multiple bifurcations of small roots) at the soil/water table interface. This phenomenon has been observed and reported in other bottomland hardwood stands subjected to saturated soils and high water tables (Leininger, 1998).

CONCLUSIONS

Many of the forest communities on the Dave Donaldson/Black River WMA are in a state of rapid decline and degradation. Mortality over the last two years in some tree species, especially Nuttall oak and sweetgum, has ranged from 20 to 80%; and crown die-back is evident in 50 to 80% of the living trees. Mortality in the mid-1980s and early 1990s in these stands was averaging only 1 to 2%. In addition, vegetation and plant communities that are developing in the understory of these dying stands are comprised almost entirely of facultative wetland species that normally occur on sites along lake, pond, or slough borders where the soils remain saturated with water most of the year. The age of buttonbush, a wetland shrub, was 5- to 6-years-old suggesting that it began invading the site in 1994-1995, the first years that growing season flooding occurred in the stands.

There are several possible causes for the rapid degradation of the oak dominated forests that developed and have existed in this flood plain for the last century. One alternative is that the oak stands have reached physiological maturity and are dying from old age. Another option is that the bottomland hardwood stands are suffering from general decline that is common in many GTR's in the South. The third alternative is that some change in soil or site conditions has occurred that has resulted in stand degradation.

An evaluation of the data and observations made in October 2000 tends to discount the first two options. For example: Even though some of the dead or dying Nuttall oak trees are approaching physiological maturity of 120 to 140 years, many of the younger Nuttall oak trees and even young trees of other species are also dying. Also, trees are only dying in large numbers on sites that have been subjected to growing season flooding in 1994-1998. Nuttall oaks that are approaching physiological maturity on sites not flooded during the growing season appear to be healthy and vigorous. In addition, on sites where oaks are dying, facultative wetland plants are invading the forest floor indicating that soils are remaining saturated during much of the year. Similar logic would also discount the option of general stand decline in GTR's. Oaks and other species are only dying in excessive quantities within the WMA on sites that were flooded during the growing season in 1994-1998, whether or not they were in a GTR. For example, excessive mortality was observed in two stands that were not under GTR management, but were flooded during the growing seasons of 1994-1998. Also, general stand decline associated with GTR management where stands are

flooded only during the dormant season would not necessarily result in a major forest type conversion from a bottomland oak forest to a wetland or swamp forest community comprised of bald cypress, water tupelo and buttonbush.

The most logical explanation for the rapid degradation of many of the oak stands in the WMA is directly related to the 1993 change in the water control plan for Clearwater Lake and the Black River. The deviation from the authorized plan has subjected the oak forest communities in the WMA, and possibly elsewhere along the river, to abnormal and extended flooding and saturated soils during much of the growing season for five consecutive years. This explanation is supported by the findings of the EA released in February, 2000 by the USACE. These findings stated that extended inundation of hardwood forests during the growing season could result in adverse impacts to species composition and habitat deterioration on the Dave Donaldson/Black River WMA.

Even though the oak forests that exist in the Black River flood plain are tolerant of dormant season flooding and wet soils, they can not tolerate repeated growing season floods and saturated soils. The prolonged growing season flooding (June -August) that occurred in 1994-1998 undoubtedly resulted in saturated soils, inadequate oxygen levels in the water and the soil, increased root respiration, and significant root mortality and die-back in many of the less water tolerant trees such as Nuttall oak and sweetgum. Kramer (1969) points out that flooding of growing plants causes much more injury than flooding of dormant plants because the growing plant roots need

higher levels of oxygen. He also emphasized that since high temperatures increase oxygen consumption of roots, flooding of the soil is much more serious in the warm growing season than in the cool dormant season. Loss of oxygen associated with increased water temperature in stagnate water during the summer months is a common cause of root mortality in flooded timber (Broadfoot, 1967). Kramer and Kozlowski (1960) also indicate that when oxygen deficits occur in warm water or saturated soils, anaerobic respiration in tree roots will damage or kill the roots.

As roots die and are unable to recover before subsequent flooding occurs, the top:root ratio of the trees become severely imbalanced. A recovery mechanism for the trees is to lose part of their top or canopy, thus die-back in the crown of the tree occurs in an attempt to better balance the deficient root system. When top die-back occurs, the tree is obviously under stress and is highly susceptible to attack by forest pathogens, such as insects and diseases. The trees are also susceptible to wind-throw and to mortality from drought. Since growing season precipitation during 1999 and 2000 was significantly below normal (> 10 inches below average each year), the rapid decline in the forest as manifested by the excessive mortality and die-back was likely the direct result of imbalanced top:root ratios and the trees' inability to provide adequate water to its crown. This phenomena would explain why mortality and die-back is generally more severe on the higher (drier) sites than on the lower more moist ones. Leininger (1998) has also observed that flooding willow oak during the growing season predisposes the trees to decline by inducing physiological stress through anaerobic conditions in

the soil, and that late summer drought conditions incite the onset of active oak decline.

A continuation of growing season flooding will, in effect, result in the change in the soil classification in the WMA (USDA-NRCS, 2000). A soil classifier with NCRS in Little Rock indicated that if the Koble soils in the WMA remain saturated for at least 10 months per year, and facultative wetland plants begin to dominate the site, then the soils would have to be reclassified as Koble (ponded) rather than the current classification of Koble silty clay or Koble soils (frequently flooded). Also, Baker and Broadfoot (1979) point out that saturated or waterlogged soils, or soils with a water table depth that is <1 foot, or with continuous flooding would have to be evaluated as unsuitable for Nuttall oak and many other hardwoods that can not tolerate these soil conditions. If growing season flooding continues, the existing oak forest ecosystem will be destroyed and replaced with a wetland community (in this case bald cypress, water tupelo, buttonbush, and various wetland herbaceous plants) that can tolerate saturated and flooded soils during the growing season.

REFERENCES

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Baker, James B. and W.M. Broadfoot, 1979. Site evaluation for commercially important southern hardwoods. USDA-Forest Service Gen. Tech. Rep. SO-26. Southern Forest Experiment Station. New Orleans, LA 51 p.

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* * *

Merchantable Timber Value Losses

a. Dead Timber

The dead timber is useless and beyond any possibility of economic recovery. Loss in merchantable value is the total tree merchantable value as it existed prior to the death of the tree. See Tables 2 and 4. The value loss is appraised at $2,301,044.54 rounded to $2,300,000.00.

b. Declining Timber

The declining trees continue to have merchantable value, but merchantability is very significantly impaired for several reasons.

1. There are qualitative losses due to sap rot, accelerated heart rot, epicormic branching, and other defect developments.

2. The irregular distribution and, in some cases, the small total volume per acre makes salvage logging inefficient and therefore unusually expensive.

3. There are social and political constraints associated with selling and harvesting the large total volume of timber involved over such a large area. This factor is aggravated by the fact that the trees are still alive and can appear to be reasonably healthy to people not accustomed to dealing with tree and forest health. The aggressive salvage that would be necessary to capture the rapidly diminishing volume of timber is not feasible.

In the absence of some significant and immediate change in the pattern of prolonged flooding during the growing season, the continued degradation of trees currently classed as being in a state of deterioration is inevitable as is their ultimate death. The appraiser estimates that tree mortality for the trees classed as being in a state of deterioration will be complete within five years. Even if adequate adjustments are immediately made in the pattern of prolonged growing season flooding, the probability of full recovery of the trees classed as being in decline is small. The appraiser estimates that, in such a situation, half of the trees will continue to decline and will be dead within five years. The rest of the declining timber will recover and live a normal life span in a degraded

condition. Reference is made to Tables 3 and 4 for the valuation of timber currently in a state of decline.

The current value loss is appraised as follows:

Full Value Loss, 50% of the timber (Rounded)	$1,636,000.00
Half Value Loss, 50% of the timber (Rounded	$ 818.000.00
Current Appraised Value Loss, Deteriorating Timber	**$2,454,000.00**

In the absence of adequate changes in the pattern of prolonged flooding during the growing season, it is likely that all of the timber classed as being in decline will be dead within five years and therefore would constitute a total loss of merchantable value. That would include an additional value loss of $818,000.00.

c. The Apparently Healthy Timber

Valuation of the losses associated with timber currently classed as being in an apparently healthy condition is more difficult than appraising the dead or dying timber. Some of the volume of healthy timber is composed of species adapted to survival in extremely wet situations. Bald cypress and water tupelo are examples of such species. Other species such as water hickory, willow, and overcup oak can tolerate an intermediate degree of growing season flooding and may survive the current flooding patterns in situations where they are located on slightly higher elevations.

Still other trees are located on areas having the highest elevations in the WMA and will be undamaged or only slightly damaged by the current flooding patterns. It is estimated that about 85% of the timber currently classed as healthy is situated adjacent to or near other timber that has recently died or that is showing obvious signs of deterioration. It is further estimated that about 80% of the apparently healthy timber is of species that cannot tolerate prolonged flooding during the growing season. Although the timber has not currently lost merchantable value, there can be no doubt that most of the timber is at very high risk and will follow the deteriorating trees through degradation and ultimate death.

In the event that adequate changes in growing season flooding patterns are immediately made, it is highly probable that most of the apparently healthy timber will survive and progress through normal life cycle patterns. Certainly there will be persistent health and quality problems in the apparently healthy timber which will arise from incipient diseases currently in the trees which were triggered by excessive flooding during past growing seasons. In the event that the current pattern of growing season flooding continues, the potential loss in value of merchantable timber is estimated to be 68% or about $4,133,000.00. See Tables 3 and 4.

Summary of Appraised Value of Losses in Merchantable Timber

A. Current value of losses incurred as of January 2001.

Dead Timber	$ 2,300,000.00
Deteriorating Timber	$ 2,454.000.00
Actual Current Loss	**$4,754,000.00**

B. Appraised value of additional losses which will occur in the absence immediate and adequate change in the water control plan.

Deteriorating Timber	$ 818,000.00
Apparently Healthy Timber	$ 4,133,000.00
Potential Losses	**$4,951,000.00**

C. Actual Current Losses and Potential Timber Losses Combined **$9,705,000.00**

* * *

Value Losses Associated With Loss of Productivity

Land has value which arises from its ability to produce income. One approach to appraising the value of the land is to discount expected future incomes using a capitalization rate appropriate for a particular situation. Appraisal theory refers to this process as the income approach to value.

The appropriate discount or capitalization rate to use in this situation is of critical importance but is

impossible to objectively determine. Public agencies sometimes have a discount rate dictated by law. The federal government requires that all agencies use a real (net after inflation) rate of 10% unless a special or exception rate is determined. An exception rate might permit the use of a lower rate in the discounted cash flow analysis to account for a strategic interest or a benefit that would not normally be included in the standard economic analysis.

The USDA Forest Service will usually use a real rate of 4% for long term investments of 10 or more years and a 10% rate for shorter term investments. Additional information on this is available in the USDA Forest Service Economic Analysis Manual under references for discount rate.

The Arkansas Assessment Coordination Division has accepted a real capitalization rate of 8% in appraising the value of commercial timberland using the income approach. In that approach, the 8% is figured as the "real" rate which means that the analysis is done using a constant dollar assumption where future prices and relative values are assumed to be the same as present prices.

For this particular situation, the prescribed rate for the State of Arkansas of 8% is thought to be too high because of the other associated values connected with the subject property. Commercial timber production is certainly not the primary motive for ownership of the property by the State of Arkansas and timber production is only a by-product of wildlife habitat management. The income derived from timber production is certainly an important collateral benefit but it is judged to be of secondary importance.

Nevertheless, the income approach to value is useful in considering the loss in value of the property associated with the loss in productive capacity of the subject lands. A capitalization rate appropriate for use in valuing the lands which are the subject of this report is judged to be 5%. The following analysis is based upon the assumption that the 5% discount rate is indeed appropriate for this situation.

Under the management systems employed in the past on WMA, the annual growth rate or timber volume accumulation rate prior to recent growing season flood patterns has been on the order of 180 board feet per acre per year whose value is on the order of $370.00/MBF. Using the value of the annual growth as a measure of the sustainable income potential from the property, an annual income of about $66.60 per acre per year can be figured. An additional income from the property, if held in private ownership, could be obtained from hunting leases. Based upon the experience of Kingwood Forestry Services in leasing and managing timberland for recreational hunting, it is estimated that the annual hunting lease income potential from the subject properties is on the order of $30 per acre per year. The total potential income to be derived from the subject properties under a management system which combines timber production with recreational hunting, is on the order of $96.60 per acre per year. Using the mathematical formula for calculating present value of a perpetual annual income, the property value can be calculated as follows:

$$\text{Present Value} = \frac{\text{Annual Income}}{\text{Discount Rate}}$$

$$\text{Present Value} = \frac{\$96.60/\text{Acre/Year}}{5\%}$$

Present Value = $1,932.00/Acre

As a result of the current flooding practices described in this report, the productivity and income potential from the subject properties is declining. Ultimately, the decline will terminate and stabilize at levels estimated as follows:

Value of timber production 50 board feet/acre/year @ $140/MBF	$7/acre/year
Hunting Value	$10/acre/year
Total Potential Income	**$17/acre/year**
Present Worth of Potential Income	**$340/acre**

The above analysis reflects a loss of $1,592 per acre. Extracting the timber losses calculated earlier, a net land value loss of about $205.34 per acre is calculated as the reduction in value of the land as a result of the current water control plan for the Black River.

Land value loss for the subject properties is obtained by simple multiplication of the per acre land value loss times the number of acres. The value loss for the

subject properties is calculated to be $1,435,326.60, rounded to $1,435,000.00

Economic Value Loss Summary

A)	Current losses from dead and declining trees	$ 4,754,000.00
B)	Potential timber value losses from declining and healthy timber	$ 4,951,000.00
C)	Potential land value loss	$ 1,435,000.00
	Total Current and Potential Losses	**$11,140,000.00**

* * *

PLAINTIFF'S EXHIBIT 90

Arkansas Game & Fish Commission
Wildlife Management Division

MEMORANDUM

TO: Robert Zachary, North Delta District I Supervisor, WMD PROJECT #261

FROM: Lou Hausman, Forester-D1, WMD
Copies: Bob Conley

DATE: July 29, 1999

SUBJECT: Black River water level management response

In reference to the material faxed to the Jonesboro office on July 27, 1999 by R.K. Leonard concerning proposed changes in the Water Control Plan for Black River, it appears to me that the proposed plan would result in the maintenance of a lower reading at the Poplar Bluff gauge throughout much of the growing season. This lower gauge reading corresponds with a more prolonged outflow of water from Clearwater Lake which translates into an extended duration of inundation downstream within the Dave Donaldson WMA. Therefore, it is my opinion as well as that of other knowledgeable District 1 personnel, that we oppose the implementation of this proposed plan in favor of compliance with the current Authorized Plan. Strict adherence to the current authorized plan would best favor the interests of the AGFC in terms of timely drainage of the Dave Donaldson WMA.

Drainage of the Dave Donaldson WMA, was never a problem, until the year 1993. In that year, and the years following until the present, drainage of this particular WMA has been greatly inhibited by artificially high river levels during the first three and one half months of the growing season. These artificially high river levels, are produced by a slower than normal evacuation (**during the growing season**) of excess water in Clearwater Lake. During the years 1993 through 1998, deviations from the authorized plan allowed for a slower than normal release, which has afforded protection to a select few individuals downstream. However it has caused slow deterioration in the species composition and degraded the habitat quality of a significant portion of the Dave Donaldson WMA.

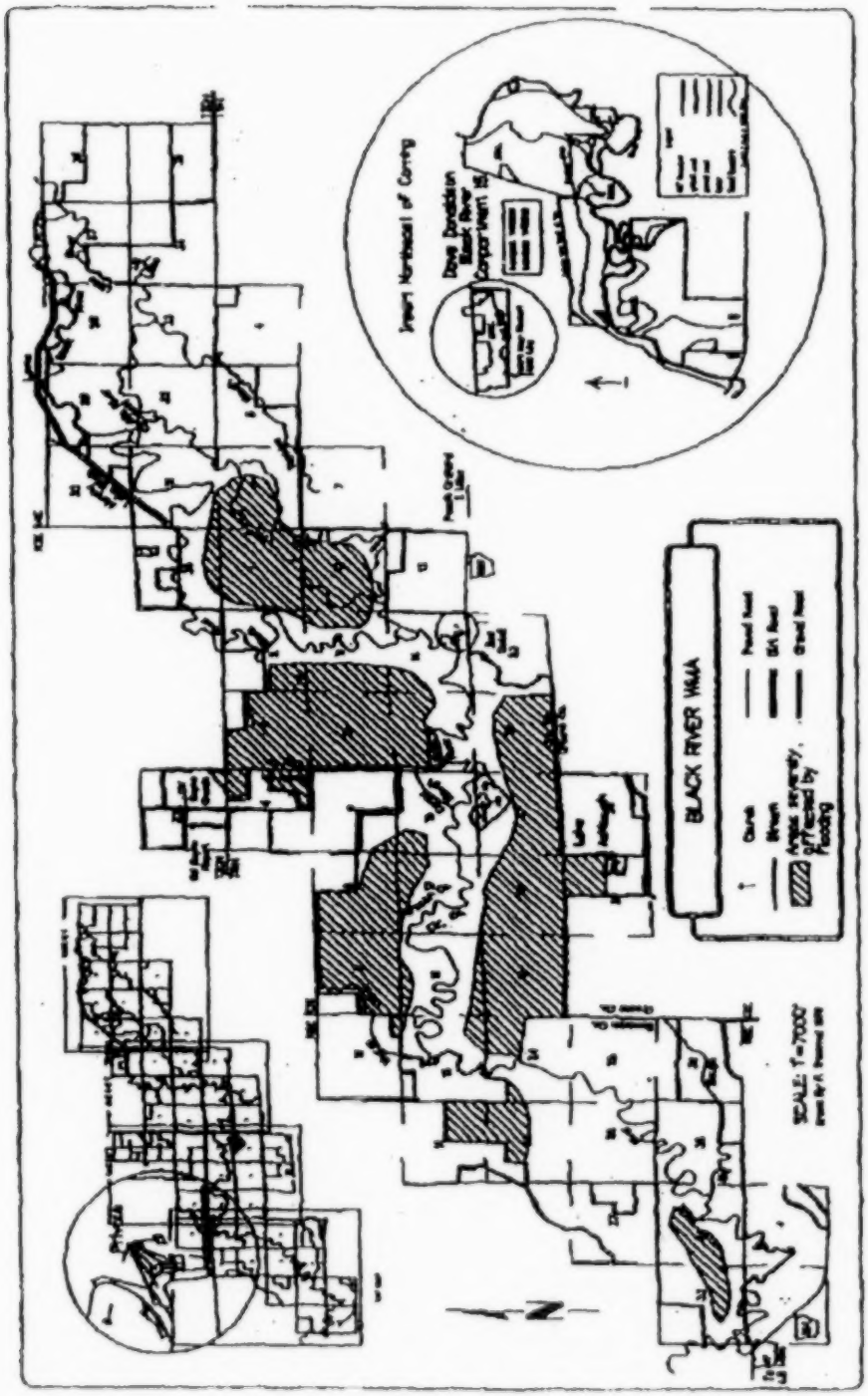
During the years, 95, 96, and 97 the so-called **interim plan** was tried, and proved to be more detrimental to the health and viability of the Dave Donaldson ecosystem. All of the other plans proposed are just mild variations of the interim plan. The only solution to the habitat degradation of the Dave Donaldson WMA, is for the U. S. Corps of Engineers to return to the original **A-U-T-H-O-R-I-Z-E-D** plan. Only, the authorized plan will most closely emulate the natural flow of the river. The authorized plan is the only one, which quickly evacuates the water from the lake and allows the river to return to a level whereby drainage of the WMA can commence.

In the last seven years, the quality of Dave Donaldson WMA habitat has been declining in the form of Red and White Oak tree mortality. This decline can be quantified in economic terms by the loss of these two valuable species. As the amount of stems

die, the number of marketable board feet declines, and the dollar amount of product is lost. The attached sheet shows that all of the inventoried compartments have declined in both numbers of stems and marketable board feet. This has translated into a loss of approximately 14 million dollars since 1993. The continuation of this transition has also left most of the remaining hard mast species in a stressed condition. The weakened condition of remaining hard mast species, has left them more vulnerable to insects and disease and has lowered their propensity for hard mast production. There are also immeasurable losses of recreational opportunities. Hard mast species, which are more desirable for both native and migratory fauna, are being replaced in many areas by undesirable buttonbush swamps. This transition will certainly have long term negative impacts on both game and non-game species.

Estimation of dollar value of mortality from artificial growing season flooding on the Dave Donaldon - Black River WMA

	Compart	Acres	Last Inv.	Vol/ acre	Total Vol.	1998 inv.	now Vol/ac	now tot vol.	$ Loss to 1998	Projected 5yr loss
	1	1219	1984	6873	8378187	1998	3436	4188484	$1,256,545.20	$1,633,508.76
	2	1531	1987	8899	13624369	1998	4449	6811419	$2,043,425.70	$2,656,453.41
	3	2756	1989	4002	11029512	1998	2001	5514756	$1,654,426.80	$2,150,754.84
	4	2306	1987	5984	13799104	1998	2992	6899552	$2,069,865.60	$2,690,825.28
	5	1714	1989	6053	10374842	1998	605	1036970	$311,091.00	$404,418.30
	6	1106	1993	4598	5085388	1998	919	1016414	$304,924.20	$396,401.46
	7	1762	1991	8285	14598170	1998	3314	5839268	$1,751,780.40	$2,277,314.52
	8	1323	1991	5716	7562268	1998	2858	3781134	$1,134,340.20	$1,474,642.26
	9	1168	1993	5200	6073600	1998	2601	3037968	$911,390.40	$1,184,807.52
	10	1372	1989	3583	4915876	1998	1791	2457252	$737,175.60	$958,328.28
	11	2136	1988	5774	12333264	1998	2309	4932024	$1,479,607.20	$1,923,489.36
	12	1359	1991	8110	11021490	1998	8110	11021490	indeterminate	
	13	1059	1989	4919	5209221	1998	990	1048410	$314,523.00	$408,879.90
	14	2114			0	1998	0	0	indeterminate	
	15	1850	1994	3133	5796050	1998	3133	5796050		$0.00
	Totals	24775			129801341			63381191	$13,969,095.30	$18,159,823.89


BLACK RIVER WMA

PLAINTIFF'S EXHIBIT 262

Arkansas Game & Fish Commission
2 Natural Resources Drive
Little Rock, Arkansas 72205

Steve N. Wilson
Director

Scott Henderson
Assistant Director

Gary Christoff
Missouri Department of Conservation
PO Box 180
Jefferson City, MO 65102

6 September 1996

RE: Black River Regulation Plan

Dear Gary:

This letter is to recap the position of the Arkansas Game and Fish Commission regarding the Black River Regulation Plan.

As you are aware, our primary concern is the health of the bottomland hardwood forest stands in the Black River Wildlife Management Area. We have been historically concerned with the extent of overbank flooding during the summer growing season on this area and have sustained damages to the timber from past water release operations. These damages have led us to frame our preference for an operating plan that results in the least number of days in which the Corning gage exceeds 6 ft. during the period 1 June through 31 October. Six foot on the Corning gage is the elevation at which we can begin to de-water the WMA.

Six foot on the Corning gage roughly equates to a release from Clearwater Lake such that the Poplar Bluff gage is 4 feet without intervening flows between Poplar Bluff and Corning.

We share these same concerns with our neighboring agricultural community in the Clay County area of Arkansas. A substantial amount of agricultural ground lies between 6 ft. and 8 ft. on the Corning gage. Our similar interests came into clear focus during the two year operation of the original Interim Plan (1994-1995) in which the Black River was regulated to 6 ft. at the Poplar Bluff gage from mid-April through November. The resulting reduction in the rate which Clearwater Lake flood pool can be evacuated and the fact that releases leading to a 6 ft. stage height at Poplar Bluff result in an 8 ft. stage height at Corning produced essentially a controlled flood over all the agricultural lands and bottomland hardwood stands lying along the Black River in Clay County, Arkansas. The modifications incorporated into the 1996 Interim Plan produced only marginally better conditions for both us and the farmers in Arkansas. These interim plans in their current form cannot not be supported by the Commission as a framework for a final operating plan.

Our common interest with the Arkansas agricultural community led us to support the plan proposed by Mr. Dale Morris (commonly referred to as the "Morris Plan"). We understand the appreciate the concerns expressed by the Corps of Engineers regarding their potential exposure to risk in the operation of the Clearwater Lake Project under the Morris Plan. However, we feel that this uncertainty may be reduced to an acceptable level by 1) operating the stage height switch dates as originally proposed in the Morris Plan,

and 2) incorporating modifications into the plan which guarantee the evacuation of the Clearwater flood pool each fall prior to the traditional onset of the winter rainy season. We remain willing to consider the Morris Plan as a viable operating plan and support using the plan on a trial basis for evaluation.

In closing, the Commission has incurred damages to the timber resources of the Black River Wildlife Management Area that we feel are directly attributable to the operation of the Clearwater Lake Project. We are very concerned about our ability to manage these timber resources for wildlife benefits under any water release plan that continues to place damaging stress on the timber. The average exceedence of 6 ft. at the Corning gage during our growing season time frame for the Period of Record has been 35.1 days according to USGS records. We are firm in our belief that a reduction in this number is needed for us to not only effectively manage the Black River WMA for the public benefit, but also recover from existing damages to the timber resources. Modeling data for the original interim Plan and its modifications hereto considered indicate that these plans would not reduce the WMA's exposure to flooding during the growing season and therefore cannot be supported. It is unfortunate that the Morris Plan has been removed from consideration before an adequate evaluation of its impact to our management area and the Arkansas agriculture community could be determined. Of the remaining options, the Authorized Plan does reduce the average number of flood days (according to modeling data) impacting the Black River WMA. We do not oppose the resumption of the original Authorized Plan for the Black River. Finally, we believe it would be premature to close this issue on the

Black River since their is not a consensus among Black River interests for any plan. We remain willing to explore other options that would move us closer to a mutually agreed operating plan.

Sincerely,

/s/_____

Michael L Armstrong
Asst. Chief/Management
Fisheries Division

cc: Earl Smith
Rep. Richard Simmons

PLAINTIFF'S EXHIBIT 266

Arkansas Game & Fish Commission
Wildlife Management Division

MEMORANDUM

TO: Don Akers, Chief, WMD

FROM: Robert Zachary, Supervisor, District I

DATE: February 22, 1996

SUBJECT: Interim Plan of Operations/Black River WMA

PROJECT #253-02-24-00

COPIES:

On February 21, 1996, I attended a meeting in Poplar Bluff, Missouri with members of the Ad Hoc Committee on the White River Reauthorization Plan. In attendance were representatives of the Missouri Conservation Department, U.S. Corps of Engineers, Clearwater Lake Association, Agricultural interest from Arkansas and Missouri and the Arkansas Game and Fish Commission Wildlife Management Division. The purpose of the meeting was for the various representatives, as a group to develop and propose to the Corps of Engineers a scenario of water release schedules for Clearwater Lake that would be mutually agreeable to all concerned parties. Such an agreement, if approved by the Corps would then be implemented this year as the operating plan for Clearwater Lake

and Black River with reference to the Poplar Bluff, Missouri, Black River gauge. This year will be the second and last year in which the lake is being operated under a temporary interim plan, pending the development and acceptance by the Corps of Engineers of a new and permanent plan of operation. Corps of Engineers officials do not plan to deviate from the new plan in order to accommodate specific requests by the various concerned interests as has been their method of operation for at least 15 years according to officials in attendance.

In order for us to dewater the greentree impoundment's on Dave Donaldson/Black River WMA (DD/BR WMA), the Black River at the Corning Gauge must be no higher than 6 feet and no higher than about 4.5 feet in order to drain some lower elevations.

Last summer, the first year of operation under the interim plan, the entire greentree system on DD/BR WMA remained completely flooded through August 1. As representative for the Commission, I pointed out the severity of the problem and requested that seasonal water releases from Clearwater Lake be designed to accommodate gauge readings of 6 ft. or less on the Corning Gauge (4 ft. on the Poplar Bluff Gauge).

I was told by the group's moderator that this was not feasible and was out of the question. The Corps of Engineers officials made the following points:

1. Clearwater Lake is designed and operated only to provide flood control and <u>not</u> drainage.

2. Clearwater Lake has absolutely no flood control capabilities downstream below the Arkansas-Missouri state line because of the run-off from tributaries in Arkansas.

While no firm compromise agreement was reached yesterday, all concerned parties were asked to consider the scenario below and meet again on March 12, 1996, in order to arrive at a consensus for presentation to the Corps for approval on this years' interim plan.

April 15 -November 1
Clearwater Pool Level
500-509 ft.
509-528 ft.
> 528 ft.

Poplar Bluff Gauge
6 ft.
8 ft.
9.5 ft.

Corning Gauge
8 ft.
10 ft
11.5 ft.

Under this plan of operation, river levels at Corning which would permit proper drainage of DD/BR WMA, would be entirely contingent upon specific lake levels in Clearwater. In the event that rainfall is above normal during the months of June and July, as was the case in 1995, DD/BR WMA would not drain prior to late summer, if at all. It became very obvious that the heightened river level from above the state line in combination with local run- off and

inflow from the Current and Eleven Point Rivers prevented drainage of the DD/BR WMA. The 1995 season was detrimental to the water intolerant oak tree species over thousands of acres in the WMA. Adoption of this proposal as a permanent plan would be disastrous, resulting in the loss of thousands of acres of bottomland hardwood trees on the WMA within the foreseeable future.

According to Corps officials, if no feasible and mutually agreeable plan is presented by the group within the next year, it will abide by it's original plan of operation. This plan provides for river levels from 10.5 ft. to 11.5 ft. on the Poplar Bluff gauge, depending upon lake levels. While this plan provides less flood control to Missouri Agricultural interests and recreational interests at Clearwater Lake, it does provide for a much more timely dewatering of DD/BR WMA in most years. While there is no guarantee that summer flooding would not occur under the old plan such off season flooding should be less frequent and less prolonged during exceptionally wet summers.

It is my recommendation that you request the Director's intervention into this matter to prevent the implementation of any future plan which does not consider the drainage needs on DD/BR WMA. Please advise if further information is needed.

RLZ:rlz:dfh

PLAINTIFF'S EXHIBIT 268

Arkansas Game & Fish Commission
Wildlife Management Division
2900 King
Jonesboro, Ar. 72401

MEMORANDUM

Reply to:
File#

TO: Robert Zachary, Supervisor-D1, WMD Attn:

FROM: Lou Hausman, Forester-D1, WMD cc:

DATE: March 6, 1996

SUBJECT: A response to the original corp authorized plan vs. the new interim plan.

The original corp **authorized plan** for evacuating excess water from the Clearwater Lake on Black River is specified to maintain a 10.5' gauge level at Poplar Bluff during the entire year until the until a **seasonal pool** of 494 msl or **conservation pool** of 498 msl is reached. The **interim plan** which has been adopted for excess water evacuation of Clearwater Lake for the last two years is to maintain a 10.5' gauge level at Poplar Bluff from November 15 until April 15 until a seasonal pool of 494 msl is reached. And during the **"growing season"** from April 15 to May 15 maintain

an 8' gauge at Poplar Bluff, and from May 15 until November 15 maintain a 6' level at Poplar Bluff until a conservation pool of 498 msl is reached.

There is an urgent need to point out the detrimental effects that the interim plan is having, and the long term effects it will have on the Dave Donaldson - Black River Wildlife Management Area, which is located approximately fifty miles south from the Clearwater Lake Dam. With the interim plan in effect as has been the case for the last two years, we find in 1994 that the Lake elevation was 530 on April 15. This elevation gives the lake a surface area of about 5000 acres. On April 15 is when the interim plan calls for the gauge at Poplar Bluff to be lowered to 8 ft, and then on May 15 the cfs release is further constricted to a 6 ft. level at Poplar Bluff. The evacuation of the water, at this time to an elevation of 498 will take at least a minimum of 60 days, assuming subsequent rainfall is average. Once 498 is reached, and the cfs discharge is lowered to inflow, then the effects of a lower gauge at Corning will not be felt until about 6 days later. So this tells us it will be about 66 days until the ability to drain the management area will begin. This is probably going to be about July 1. In the years 1994 and 1995 it was about the third week in July before drainage operations could begin on the Dave Donaldson - Black River W.M.A.

It is our position that the interim plan is detrimental to the biological integrity of the area. The reasons for this is that the higher artificial elevations of the river force water to stay in the lower portions (approximately 30% of the area) for periods on up into July. During this time temperatures become much warmer, and backed up water on the area will not

allow for any oxygen to reach tree roots. This is extremely harmful to bottomland red oak species such as Nuttall Oak, Willow Oak, and White Oak species such as Overcup Oak. These three species comprise 80 percent of the volume and species composition of this management area. They also comprise the largest percentages of hard mast for migratory waterfowl and native species of wildlife. This slow gradual death of the lower portions of the management area will result in the loss of reproduction of hard mast bearing species, as well as cause a type change to less desirable softwood species or buck brush.

The alternative or compromise plan which was being suggested by the Corps of Engineers at the meeting in Poplar Bluff on February 27 was to have the excess water evacuated relative to the msl stage of Clearwater Lake. This plan actually would vary little from the interim plan now in place, because during the growing season, cfs release would be constricted to a smaller amount, which would stretch out the number of days before effective drainage could begin on the Wildlife Management area. This will result in a much longer duration of stagnant water being held on the biologically and economically valuable hard mast bearing species of trees.

It appears that the authorized plan probably emulates natural conditions more than the interim or alternative plan. Using the graphs supplied by the Corp, the data shows that the Lake level has exceeded the 528 msl level 13 times during the last 56 years during the growing season. This is an average of every 4.3 years. If we adopt the interim or alternative plan this tells us that if the Lake exceeds the 528 msl level at any time during the growing season that cfs flow

will be constricted to an 8 or 6 foot gauge at Poplar Bluff. This means that with the alternative plan that we could possibly face continuous flooding of the area all summer long , or at least until mid August until excess lake water was evacuated. This is clearly unacceptable to our management goals. This may also force us to abandon some of the routine maintenance and operations that take place on the area every year. These operations would consist of timber management, levee repair, and road maintenance.

The Arkansas Game and Fish Commission's interpretation of all plans, with the exception of the original authorized plan is that they stand to compromise the aesthic, economic, and wetland characterisics of this unique area.

PLAINTIFF'S EXHIBIT 476

UAP Distribution, Inc.
Evaluation of Vegetation
Management Requirements
For Control of Invasive Species on
Arkansas Game & Fish Commision
Dave Donaldson Black River
Wildlife Management Area

Problem:
The Arkansas Game and Fish Commission (AGFC) Dave Donaldson Black River Wildlife Management Area is made up of approximately 25,000 acres located along the Black River in Greene, Clay, and Randolph counties in Arkansas. The original forest was primarily a Nuttall Oak (*Quercus nuttalli*) and Overcup Oak (*Quercus lyrata*) bottomland hardwood forest, with Nuttall Oak being the primary oak species.

Nuttall Oak acorns are a preferred food of many waterfowl and because of the abundance of Nuttall Oak in this forest the Dave Donaldson Black River Wildlife Management Area was once one of Arkansas' best wildlife management areas for waterfowl. However, this is no longer the case for the inspected 6,990 acres of the Dave Donaldson Black River Wildlife Management Area. These acres have been subjected to numerous years of flooding during the growing season and the majority of the Nuttall Oak in the areas died. The new forest that is coming back on these 6,990 acres consist of Overcup Oak and other species that are not as beneficial to waterfowl as Nuttall Oak.

The cause of the growing season flooding has been identified and controlled and AGFC now desires to re-

establish Nuttall Oak by artificially regenerating (planting) Nuttall Oak on the 6,990 acres that were affected by growing season flooding. Before Nuttall Oak can be re-established the undesirable species must be controlled.

Actions:
AGFC contacted UAP Distribution, Inc. (UAP) to develop a vegetation management plan to control the undesirable arborescent and non-arborescent species in the understory and mid-canopy of the forest on the 6,990 acres in which they would like to re-establish Nuttall Oak. UAP conducted on-site inspections of areas in which AFGC wants to re-establish Nuttall Oak and the following findings and recommendations are based on UAP's site inspections and evaluations.

UAP Site Evaluation Findings:
UAP made two separate trips to conduct on-site evaluations of the flood impacted areas of the Dave Donaldson Black River Wildlife Management Area. These site evaluations were conducted by Rick Watts, Territory Manager, UAP. These evaluations consisted of field inspection of representative samples of areas with varying degrees of flooding impacts. The degrees of impact varied from severely impacted to moderately impacted.

In the areas that are rated as being severely impacted, all of the original overstory and mid-story are dead from previous growing season inundation. These sites tend to be in the wettest portion of the landscape. A heavy cover of herbaceous weeds primarily, Smartweed (*Polgonum sp.*) and Lizards Tail (*Saururus cernus*) now occupy these sites. Non-arborescent species are also starting to occupy these sites, the most

prominent of which is Buttonbush (*Cephalanthus occidentalis*).

All of the Nuttall Oak and most of the Overcup Oak overstory are dead and most of the arborescent species that were in the mid-story are surviving in the areas that are rated as being heavily impacted by growing season inundation. These sites tend to be in the more moderately drained portions of the landscape. The arborescent species that did make up the forest mid-story is now the forest overstory.

The predominant arborescents that are now in the overstory on these areas are; Hackberry (*Celtis occidentalis*), Ash (*Fraxinus sp.)*, Honeylocust (*Gleditsia triacanthos)*, American Elm (*Ulmus americiana)*, and Persimmon *(Diospyros virginiana*). The mid-story on these sites are now primarily Buttonbush (*Cephalanthus occidentalis*) and Swamp Cyrilla (*Cyrilla racemiflora*). Only a light herbaceous layer of Smartweed *(Polgonum sp.)* are in these areas.

Nuttall Oak is the principal species that died in the overstory in the areas that are rated as being moderately impacted by growing season inundation. In these areas Overcup Oak seedlings are numerous in the holes created in the forest by the dead Nuttall Oaks and the arborescent species that were in the mid-story are rapidly taking over these areas.

Based on UAP's inspections the following table presents a breakdown of the number of acres impacted by the prolonged growing season inundation by area and severity:

	Acres by Inundation Impact*		
Area	**Severe**	**Heavy**	**Moderate**
Shavers Eddy	25	172	295
Gar Slough	59	415	711
Winchester GTR	104	730	1,252
Reyno GTR	92	646	1,107
Little River Island GTR	69	484	829
	349	2,447	4,194

* Acreages are from Kingwood Forestry Services, January, 2001 Damage Appraisal Report and were provided by AGFC.

UAP Treatment Recommendations:
UAP's recommendations for treatment focus on a holistic Intergrated Pest Management (IPM) strategy. Our IPM strategy consist of using herbicides and application methodologies, or combinations thereof, that will result in the best control of the undesirable species on the forest floor to mid-canopy with the least amount of collateral damage to the desirable species in the forest upper canopy.

1. Herbicide recommedations:
   a. Pathfinder II (triclopyr + basal oil ready-to-use formulation) for low volume basal applications.
   b. Pathway (picloram + 2,4D ready-to-use formulation) for hack and squirt applications.
   c. Oust or equivalent (sulfmeturon methyl) for herbaceous weed control.

Some collateral damage to desired residual crop trees may result from the movement of herbicides through root grafting with treated trees.

2. Application Methodology Recommendations:
   a. Low Volume Basal Bark Treatment
      Those areas that have substantial amounts of Buttonbush, Cyrilla, and ≤4 inches DBH susceptible hardwood saplings, such as found on the heavy and moderate flood impacted areas, will be treated using the low volume basal bark treatment.

      To control susceptible woody plants with stems ≤4 inches DBH apply Pathfinder II with a backpack sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of the brush and tree trunks in a manner which thoroughly wets the lower 12 to 15 inches of stems, including root collar area, but not to the point of runoff. Herbicide concentration will vary with size and susceptibility of species treated. This is selective treatment application but some damage to untreated trees may occur because of root grafting. Buttonbush will require a higher concentration of herbicide because of its thick bark. Apply at anytime, including the winter months, except when snow or water prevent spraying to the ground line.

   b. Hack and Squirt Injection Treatment:
      The entire 6,990 acres of flood impacted area will require hack and squirt injection

treatment to remove the undesirable species in the forest mid-canopy. The amount of tree injection required will vary according to the severity of flood impact on the area.

To control undesirable tree species that are greater than 4 inches DBH and less than 8 inches DBH, use a hatchet, or similar device, to make cuts at a downward angle completely through the bark and cambium at intervals of 2 to 3 inches between edges of the cuts around the tree. All cuts to trees should be made at a height 2 to 4 feet above the ground. Using a squirt bottle, syringe, or similar device, apply 1 milliliter of undiluted Pathway into each cut, ensuring that the solution does not run out of the cut. This is selective treatment application but some damage to untreated trees may occur because of root grafting.

c. Backpack Broadcast Herbaceous Weed Control

The entire 6,990 acres should be treated to control the herbaceous seed bank in the soil.

To control herbaceous weeds the first growing season following planting, 4 ounces of Oust should be applied. Application will be accomplished using backpack sprayers and the mixture will be applied at a total mix rate of 7.5 gallons per acre. The treatment can be carried out in the fall prior to planting or in early spring after planting, but prior to bud break.

UAP Estimated Cost:

1. Herbicide and Adjuvant cost
   - A. Pathfinder II $39.45/gallon
   - B. Pathway $29.20/gallon
   - C. Oust XP $125.00/pound

2. Application Cost Per Acre
   - A. Low Volume Basal Bark Treatment
     - 1) Severe Impact Area (<500 stems/acre) $55.00/acre
     - 2) Heavy Impact Area (>2,000> <10,000 stems/acre) $75.00/acre
     - 3) Moderate impact Area (500> <2,000 stems/acre) $65.00/acre
   - B. Hack and Squirt Injection
     - 1) Severe Impact Area $30.00/acre
     - 2) Heavy Impact Area $40.00/acre
     - 3) Moderate impact Area $40.00/acre
   - C. Backpack Broadcast Herbaceous Weed Control
     All areas $30.00/acre

3. Herbicide Cost Per Acre
   - A. Low Volume Basal Bark Treatment
     - 1) Severe Impact Area (<500 stems/acre)
       1 gallon Pathfinder II/acre $39.45/acre
     - 2) Heavy Impact Area (2,000> <10,000 stems/acre)
       5 gallons Pathfinder II/acre $197.25/acre
     - 3) Moderate impact Area (500> <2,000 stems/acre)
       2.5 gallons Pathfinder II/acre $98.63/acre

   - B. Hack and Squirt Injection
     - 1) Severe Impact Area

(<100 stems/acre)	
0.5 quart Pathway/acre	$3.65/acre
2) Heavy Impact Area	
(250> <1,000 stems/acre)	
2.5 quarts Pathway/acre	$18.25/acre
3) Moderate impact Area	
(100> <250 stems/acre)	
0.75 quarts Pathway/acre	$5.48/acre
C. Backpack Broadcast Herbaceous Weed Control	
All areas	$31.25/acre

4. Treatment Cost Summary

	Acres	Cost/Ac	Total Cost
A. Low Volume Basal Bark Treatment			
1) Severe Impact Area	349	$94.45	$32,963.05
2) Heavy Impact Area	2,447	$272.25	$666,195.75
3) Moderate impact Area	4,194	$163.63	$686,264.22
	6,990	$231.26	$1,385,423.02
B. Hack and Squirt Injection			
1) Severe Impact Area	349	$33.65	$11,743.85
2) Heavy Impact Area	2,447	$58.25	$142,537.75
3) Moderate impact Area	4,194	$45.48	$190,743.12
	6,990	$60.86	$345,024.72
C. Backpack Broadcast Herbaceous Weed Control			
All Areas	6,990	$61.25	$428,137.50
TOTAL ESTIMATED PROJECT COST:	6,990	$353.36	$2,158,585.24

UAP Conclusion:

It will take approximately $2,472,063.94 to control competing vegetation on the flood impacted areas of the Dave Donaldson Black River Wildlife Management Area. In addition to these costs, additional cost will have to be incurred to clear out roads for access into the project. Men, equipment, and supplies must be able to access these properties by means other than the water control levees around the GTR areas. If the contractor has to come back to the levees for fuel, water, or chemicals, productivity will go down and the cost estimates above for application may be low.

PLAINTIFF'S EXHIBIT 491

Dr. Jerry Overton Summary Tables and Graphs of Corning Gauge Data

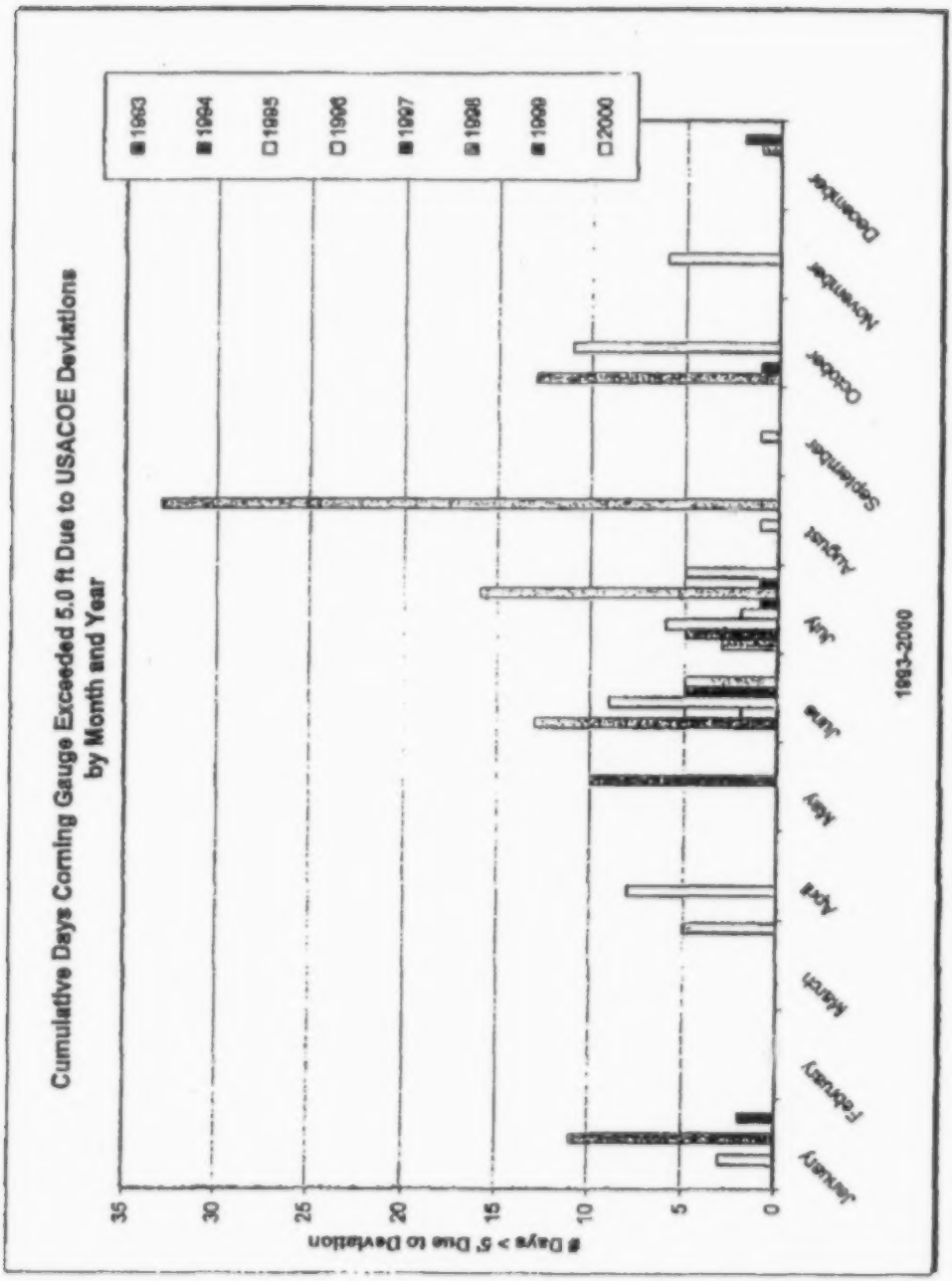
Monthly Summary of Corning Gauge Above 5.0 Feet Due to USACOE Deviations

Months	1993	1994	1995	1996	1997	1998	1999	2000	TOTALS	Months
January	0	0	3	0	11	0	2		16	January
February	0	0	0	0	0	0	0	0	0	February
March	0	0	0	0	0	0	0	5	5	March
April	0	0	8	0	0	0	0		8	April
May	0	0	0	0	10	0	0	0	10	May
June	0	13	2	9	5	5	0	0	34	June
July	3	5	6	2	1	16	1	5	39	July
August	0	0	0	1	0	33	0	0	34	August
September	0	0	0	1	0	0	0	0	1	September

	Months	1993	1994	1995	1996	1997	1998	1999	2000	TOTALS	Months
Flooded –	October	13	1	0	11	0	0	0	0	25	October
	November	0	0	0	6	0	0	0	0	6	November
	December	0	0	0	0	0	1	2	0	3	December
		16	**19**	**19**	**30**	**27**	**55**	**5**	**10**	181	

156 Growing Season

ATOKA, Inc.


Cumulative Days Corning Gauge Exceeded 5.0 ft Due to USACOE Deviations by Month and Year
1983-2000
Days > 5' Due to Deviation
0
5
10
15
20
25
30
35
January
February
March
April
May
June
July
August
September
October
November
December
1983
1984
1985
1986
1987
1988
1999
2000

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Summary Table of Deviations and Corning Gauge Data

Year	Deviation Dates	Total Days Deviation	Total Days Corning Stage > 5.0 feet Due to Deviation [1]	Total Days within the Growing Season (3/1 - 10/31) Corning > 5.0 Due to Deviation	Dates Corning Gauge >5' Due to Deviation
1993	7/1/93 - 7/5-93 (5); 9/29/93 - 10/29/93 (31)	36	16	16	7/4-7/6; 10/12-10/21; 10/27-10/29
1994	4/1/94 - 11/30/94	275	19	19	6/14 - 6/26; 7/13; 7/21-7/24; 10/24
1995	4/1/95 - 11/30/95	274	19	16	1/5-1/7; 4/7-4/11; 4/26-4/28; 6/7-6/8; 7/19-7/21; 7/26-7/28;

Year	Deviation Dates	Total Days Deviation	Total Days Corning Stage > 5.0 feet Due to Deviation [1]	Total Days within the Growing Season (3/1 - 10/31) Corning > 5.0 Due to Deviation	Dates Corning Gauge >5' Due to Deviation
1996	4/1/96 - 5/19/96 (49); 6/1/96 - 11/30/96 (214)	263	30	24	6/19-6/22; 6/26-7/2; 8/3; 9/28; 10/7-10/17; 11/6-11/7; 11/21-11/24
1997	6/3/97 - 7/5/97	33	27	16	1/11-1/21; 5/6-5/15; 6/16-6/18; 6/27-6/29; 7/5
1998	6/11/98 - 6/31/98	21	55	54	6/11-6/13; 6/19-6/20; 7/5-7/20; 8/24-9/25; 12/27

Year	Deviation Dates	Total Days Deviation	Total Days Corning Stage > 5.0 feet Due to Deviation [1]	Total Days within the Growing Season (3/1 - 10/31) Corning > 5.0 Due to Deviation	Dates Corning Gauge >5' Due to Deviation
1999	1/1/99 - 12/31/99	365	5	1	1/13-1/14; 7/1; 12/12; 12/21
2000	1/1/2000 - 12/31/00	366	10	10	3/13-3/14; 3/31; 7/2-7/6
Totals		1633	181	156	

[1] The total number of days the Corning gauge was at or above 5.0 feet due to USACOE deviations is based on the following evaluation:
1) The dates of deviations for each year (1993-2000) were tabulated;
2) The observed Corning gauge data based on daily readings (USGS 2001) was tabulated;
3) The SuperModel data for the Corning gauge at or above 5.0 feet (Nutter 2008) were plotted.

Where the observed data exceeded the super data during or immediately following a USACOE devation, those days constitute number of days the Corning gauge was above 5.0 feet due to deviations.

Supreme Court, U.S.
FILED
JUN 27 2012

No. 11-597

In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

JOINT APPENDIX Vol. 3 of 3

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June 27, 2012

Petition for Writ of Certiorari filed November 9, 2011
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PLAINTIFF'S EXHIBIT 500

DAVE DONALDSON/BLACK RIVER WILDLIFE MANAGEMENT AREA RESTORATION AND MANAGEMENT PLAN

Prepared For:

ARKANSAS GAME AND FISH COMMISSION
2 Natural Resources Drive
Little Rock, Arkansas 72205

By:

Mickey E. Heitmeyer
Gaylord Memorial Laboratory
University of Missouri-Columbia
Puxico, Missouri 63960

June 2006

* * *

EXECUTIVE SUMMARY

The Dave Donaldson/Black River Wildlife Management Area (WMA), owned and managed by the Arkansas Game and Fish Commission (AGFC), contains 22,925 acres of bottomland hardwood forested wetlands (BLH) along 25 miles of the Black River in northeast Arkansas. The WMA, and adjacent privately owned BLH along the Black River floodplain, is one of the few large blocks of BLH remaining in the

Mississippi Alluvial Valley (MAV), has a rich diversity of plant and animal communities, and provides many important ecological and societal functions and values. The WMA is identified as critical wintering habitat for waterfowl by the North American Waterfowl Management Plan and critical habitat for many neotropical migrant bird species of concern by the North American Bird Conservation Initiative. The WMA also supports many state- and federal-listed threatened and endangered species of plants and animals.

Historically, seasonal, short duration, overbank flooding of the Black River was the primary ecological process that established and sustained the BLH ecosystem. Many factors have altered this ecosystem including construction of Clearwater Lake upstream on the Black River, regional and local deforestation, intensive agricultural production and associated chemical and nutrient runoff, extensive roads and ditches, and development of parts of the WMA as greentree reservoirs (GTRs). Recently, severe degradation of the WMA occurred when water releases from Clearwater Lake during 1993-2000 deviated from previous lake management plans and caused higher, more sustained, flows in the Black River during summer. These releases inundated >30% of red oaks on the WMA for extended periods during May-July and caused high mortality of Nuttall and willow oak. Collectively, the importance of the WMA, and continued degradations, create an imminent need to sustain the critical ecological components of this ecosystem and restore degraded areas and processes.

This report provides a comprehensive analyses of historic and existing ecosystem conditions in the WMA

and provides recommendations for future management and restoration of BLH resources. Objectives are to 1) identify the historic ecosystem condition and ecological processes in the WMA; 2) evaluate changes in the WMA and surrounding region from historic condition related to alterations in hydrology, vegetation, and resource availability to key fish and wildlife species; and 3) identify restoration and management approaches and ecological attributes needed to successfully restore and manage BLH in the WMA.

The Black River WMA lies in the northwest part of the Western Lowland of the Lower MAV created by cyclic Pleistocene glaciation events. The Black River floodplain and WMA largely is a point bar Holocene-derived geomorphic surface with numerous "ridge-and-swale" topographic complexes distributed in a low elevation, relatively flat "sump" or "bowl." This geological setting created a labyrinth of interconnected sloughs, side channels, and distributary channels that allow water to move in a "sheet-like" manner across the Black River floodplain during flood events. Topography is heterogenous in the WMA and sustains a mosaic of tree species in riverine backwater and riverine overbank BLH communities. These communities are mostly low and intermediate BLH types dominated by Nuttall oak and overcup oak.

Only a few European settlers were present in the Black River region until the mid 1800s. Railroads were built to larger towns such as Poplar Bluff, Missouri and Corning, Arkansas in the early 1870s and sparked establishment of other towns, a

* * *

INTRODUCTION

The Dave Donaldson/Black River Wildlife Management Area (hereafter Black River WMA), owned and managed by the Arkansas Game and Fish Commission (AGFC), contains 22,925 acres of bottomland hardwood forest (BLH) along 25 miles of the Black River in northeast Arkansas (Fig. 1). Most of the WMA is a large (ca. 21,075 acres) contiguous block of BLH between Corning and Pocahontas, Arkansas and is the subject of this report. The WMA also administers 1850 acres of mitigation land located northeast of Corning that was transferred to AGFC in 1988. The WMA is managed to: 1) protect and sustain a functional BLH ecosystem; 2) support populations of endemic plant, fish, and wildlife species; and 3) provide public use opportunities, especially waterfowl hunting. The corridor of BLH habitat in, and adjacent to, the WMA is the largest contiguous block of BLH along the Black River in Missouri and Arkansas and is among the largest contiguous areas of BLH in any floodplain in the Upper Mississippi Alluvial Valley (MAV). This BLH habitat has been identified as critical wintering waterfowl habitat by the Lower Mississippi Valley Habitat Joint Venture of the North American Waterfowl Management Plan (Yaich 1990) and as critical habitat for many neotropical migrant bird species of concern (Twedt et al. 1999, Mueller et al. 2000). Additionally, this region supports a rich diversity of endemic plant and animal communities, has regionally- and continently-important ecological and societal functions and values (e.g., groundwater recharge, flood water storage, water filtration, C storage, etc.); and provides excellent recreational and educational opportunities.

Seasonal, short duration, overbank flooding is the primary ecological process sustaining BLH ecosystems in active river floodplains in the MAV, including the Black River region (Fredrickson et al. 2005). Since Clearwater Lake was constructed by the U.S. Army Corps of Engineers (USACE) on the Black River near Piedmont, Missouri (dam closed in late 1948) the downstream water regimes in the Black River and its floodplains, including the Black River WMA, have been altered. Additionally, many other changes to the structure and function of the Black River floodplain in and near the WMA have occurred in the past 2-3 decades from regional and local deforestation (e.g., Twedt and Loesch 1999); intensive agriculture production and associated chemical and nutrient runoffs (e.g., Smith 1992); and alteration of regional and local hydrological regimes from extensive roads, ditches, levees, and water-control structures (Arkansas Soil and Water Conservation Commission 1988). Ecological changes of special concern on the WMA are: 1) degraded forest health, composition, and regeneration; 2) altered timing, depth, and duration of flooding; 3) decreased abundance and availability of BLH resources; and 4) lower diversity and abundance of fish and wildlife populations, especially wintering ducks.

Currently, management of Clearwater Lake water levels controls much of the seasonal stage and discharge of the Black River in and near the Black River WMA. From 1953 to 1993 Clearwater Lake levels and releases were managed to reduce flooding potential near Poplar Bluff, Missouri by attempting to keep Black River levels < 11.5 feet in winter and < 10.5 feet from spring through fall (USACE 1995). To accommodate this plan, water stored in Clearwater

Lake was regularly released in short, high discharge, "pulses" in late winter and spring and these releases caused relatively natural short pulses of overbank flooding along the lower Black River in southern Missouri and northeast Arkansas. Water releases from Clearwater Lake were reduced in early summer and BLH floodplains in the Black River WMA typically dried by late May. Starting in 1993, water release schedules from Clearwater Lake were altered and lower discharge, but more sustained, releases were made throughout spring and summer. These sustained releases prevented the need for short-term, high discharge, flows in the Black River during late spring and summer, but ultimately caused higher (> 5 feet at the Corning gauge), more sustained water levels in the river below Poplar Bluff, and prolonged flooding of BLH in the WMA during the growing season (AGFC 1999). This higher spring/summer release not only increased surface water flooding in the WMA , but also caused BLH floodplain soils to have prolonged saturation through much of the year (Atoka, Inc. 2001). In 2000, water releases from Clearwater Lake returned to pre-1993 schedules, but BLH communities in the WMA had become severely degraded (e.g., extensive mortality of red oak communities) from the prolonged spring/summer flooding and extended soil saturation during 1993-1999 (Kingwood 2001a, b).

This report provides comprehensive analyses of historic and existing ecosystem conditions in the Black River WMA and presents recommendations for future management and restoration of BLH resources.

Objectives of the report are to:

1. Identify the historic ecosystem condition and ecological processes in the Black River WMA. Historic in formation includes pre-European settlement, pre-Clearwater Lake, and pre-1993 periods.

2. Evaluate changes in the WMA and surrounding region from the above historic conditions with special reference to alterations in hydrology, vegetation community structure and distribution, and resource availability to key fish and wildlife species.

3. Identify restoration and management approaches and ecological attributes needed to successfully restore and manage specific BLH habitats and conditions within the WMA.

By addressing these objectives future management of the WMA can: 1) develop appropriate and realistic "habitat-based" objectives, 2) understand, and at least partly mitigate, negative impacts of altered water releases from Clearwater Lake, 3) incorporate "state-of-the-art" scientific knowledge of BLH ecological processes, and 4) provide for multiple uses including recreational and educational opportunities for the public.

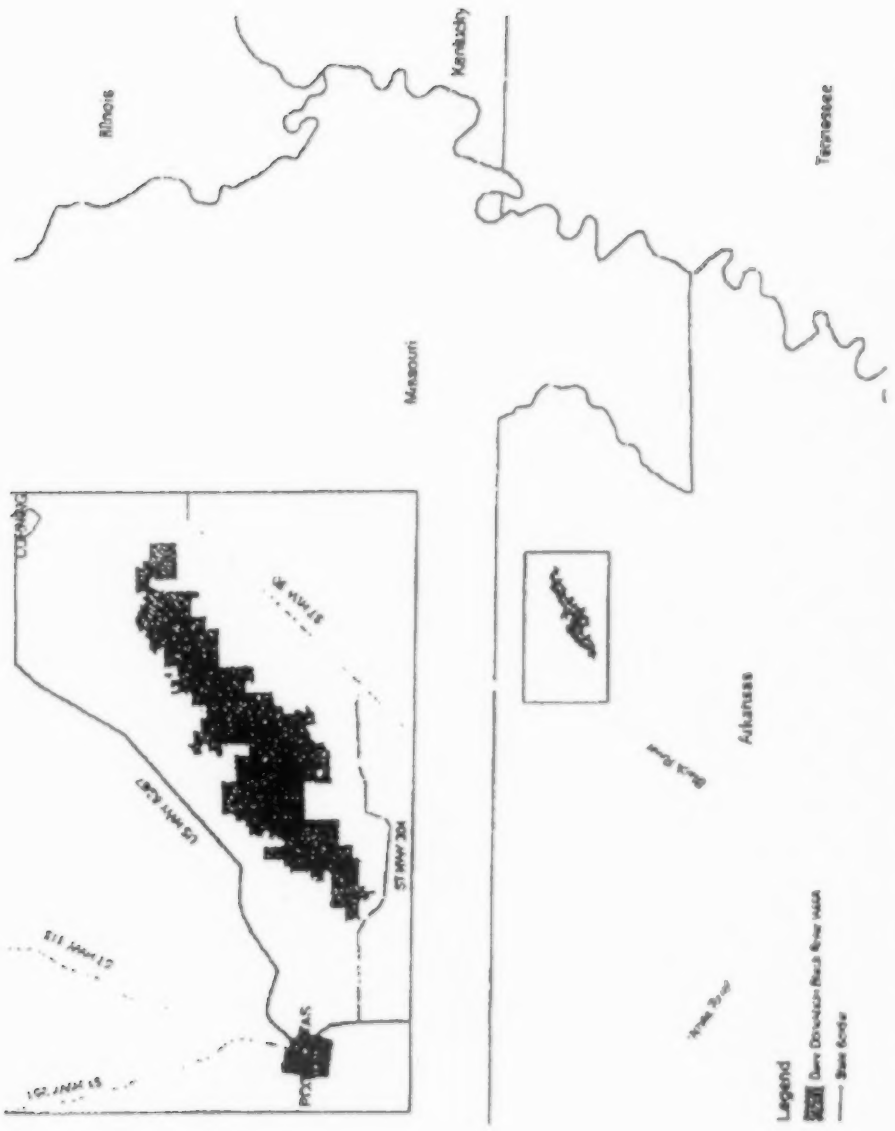


Figure 1. General location of the Black River/Dave Donaldson Wildlife Management Area in northeast Arkansas.

* * *

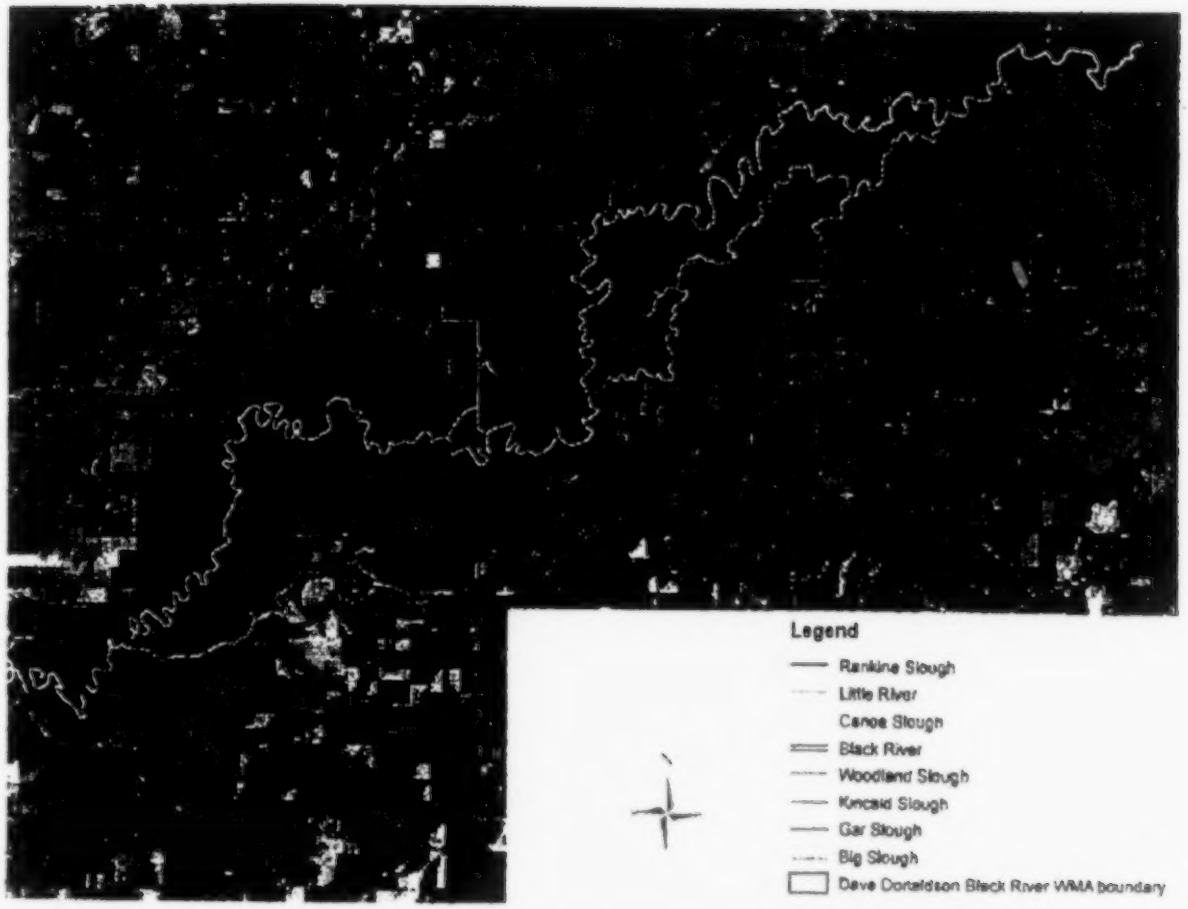


Figure 7. Major rivers, sloughs, and distributaries of the Black River Wildlife Management Area, Arkansas.

CLIMATE AND HYDROLOGY

The climate of Clay and Randolph counties (the majority of the WMA) is warm temperate and strongly seasonal with warm summers and mild winters (Table 1). Summers are hot and humid and influenced by moist air masses from the Gulf of Mexico. Little snow occurs in the area (average of 8.2 inches annually). Average date of first freezing temperature is 11 October and average date of last freezing temperature is 4 April. Average growing season for the area is about 200 days. Annual rainfall for the area is about 46.4 inches. Precipitation is lowest in late summer and increases from November through winter and early spring (Table 2). Peak monthly precipitation occurs in May.

Hydrology in the Black River floodplain historically was controlled by local precipitation, runoff from local streams and sloughs, and water levels (stage and discharge) in the Black River. Most of the water flowing into the Black River WMA floodplain originates from upstream drainage into the Black River. Some backwater flooding of the Black River occurs in the southwestern part of the WMA when the Current River is high and effectively "dams" Black River flows near the confluence. Large local rainfall events can cause significant, but usually short duration, water drainage into, and local flooding along, streams and sloughs (such as Gar Slough and Murray Creek) that flow south into the WMA. Flows in the Black River at Corning about 5 miles upstream from the WMA, have been monitored since 1938 (U.S. Geological Survey 2005) and primarily are a function of rainfall and snow melt (albeit a relatively minor contribution) in the mid-and upper-Black River Basin.

Seasonal flooding is a dominant feature of the hydrology that controls the habitat community structure of the Black River floodplain in the WMA region. Most BLH communities on the WMA are shallowly (< 2 feet) flooded when the Black River reaches 6 feet and a discharge of ca. 1520 cubic feet/second (cfs) at the Corning gauge (Fig. 8). BLH on the WMA does not completely drain until the Black River is < 4 feet (discharge of about 1200 cfs). Soils in the WMA remain saturated until the Black River is 3-4 feet (discharge of about 1200-1400 cfs). Gauge data at Corning are available only for 10 years (1939-48) prior to construction of Clearwater Lake but these data suggest a highly dynamic seasonal and annual flooding regime in the Black River flood plain (Table 3). During 1939-48, the WMA was flooded about 105 days each year, with most flooding occurring from December through May. Generally more flooding occurred during the dormant winter season months than during early growing season periods. Flooding in mid summer was rare and of short duration (e.g., 8 days of flooding during August 1942). Flooding on the WMA historically occurred in several "flood pulses" annually (mean of 6 pulses/yr) with pulses lasting nearly 19 days/pulse.

The Black River WMA has been flooded (>1520 cfs, 6 feet, at the Corning gauge) at least once annually since records began in 1939, however, annual variation is high (range of 306 days in 1985 to 36 days in 1954) (Figs. 9, 10). Prior to Clearwater Lake, annual flooding ranged from 55 days in 1940 to 166 days in 1942. In sum, flooding on the WMA historically was dominated by several late winter and early spring flood pulses of

Table 1. Temperature data for Corning, Arkansas, 1951-74.

Month	Temperature			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with . . .	
			Maximum temperature equal to or higher than	Minimum temperature equal to or lower than
	Degrees F.	Degrees F.	Degrees F.	Degrees F.
January	46.80	27.20	72.00	2.00
February	51.30	30.50	74.00	6.00
March	60.10	38.30	83.00	15.00
April	72.50	49.00	89.00	28.00
May	81.00	57.30	94.00	36.00
June	89.20	65.30	101.00	49.00
July	92.20	68.70	102.00	53.00
August	90.90	66.40	102.00	52.00
September	84.00	59.40	98.00	40.00
October	74.40	47.50	92.00	27.00
November	60.20	37.40	81.00	16.00
December	49.40	30.60	72.00	7.00
Year Mean	71.00	48.13	104.00	0.00

Table 2. Precipitation data for Corning, Arkansas, 1951-74.

Month	Precipitation		
	Average monthly total	Two years in 10 will have	
		Less than	More than
	Inches	Inches	Inches
January	3.99	1.79	5.77
February	3.51	2.11	4.75
March	4.63	2.46	6.39
April	4.51	2.56	6.09
May	5.48	3.02	7.48
June	3.06	1.52	4.31
July	3.96	2.02	5.54
August	3.04	1.30	4.46
September	3.70	1.36	5.57
October	2.44	0.81	3.74
November	4.28	2.08	6.07
December	3.81	2.01	5.27
Year Mean	46.41	38.15	54.24

Figure 8. Flooding of bottomland hardwood forests on the Black River Wildlife Management Area when the Black River stage at Corning, Arkansas was 6 feet, April, 2005.

the Black River, with longer pulses occurring in late winter and shorter duration pulses occasionally extending into late spring.

DISTRIBUTION AND ECOLOGICAL PROCESSES OF HISTORIC VEGETATION COMMUNITIES

Few published accounts exist about the habitat composition of the Black River floodplain in and near the Black River WMA prior to European settlement. Nonetheless, U.S. Government Land Office survey maps prepared in the mid 1800s, early settler and naturalist accounts, habitat maps, and historic photographs (e.g., Featherstonhaugh 1844, Holder 1951, Stanard 1993, 1994) indicate that essentially the entire region was covered by BLH forest interspersed with numerous sloughs, oxbows, and small swale drainages.

A model of broad habitat types historically present in the region was constructed for the region based on geomorphological, soil, topography, and flood frequency position (Fig. 11) similar to that prepared for other floodplain basins in eastern Arkansas (Klimas et al. 2002, 2005; Heitmeyer et al. 2002). For example, most of the WMA historically was Holocene point bar, Kobel soil, and within the 2-year floodplain;

Table 3. Flooding characteristics of the Black River near Corning, Arkansas 1939-2004.

	1939-48	1949-92	1993-99	2000-04
Flooding >6'				
Days in growing season	50.60	64.70	91.14	55.60
Days in dormant season	54.80	77.80	100.43	65.80
# Pulses	6.00	5.20	5.43	7.40
$\bar{x}$ Days/pulse	18.70	31.70	35.29	17.20
Number years	10.00	44.00	7.00	5.00
Flooding >5'	1939-48	1949-92	1993-99	2000-04
Days in growing season	54.30	68.45	97.43	58.80
Days in dormant season	61.10	82.86	108.86	70.00
# Pulses	6.30	5.64	5.00	7.20
$\bar{x}$ Days/pulse	18.32	26.85	41.26	17.89
Number years	10.00	44.00	7.00	5.00

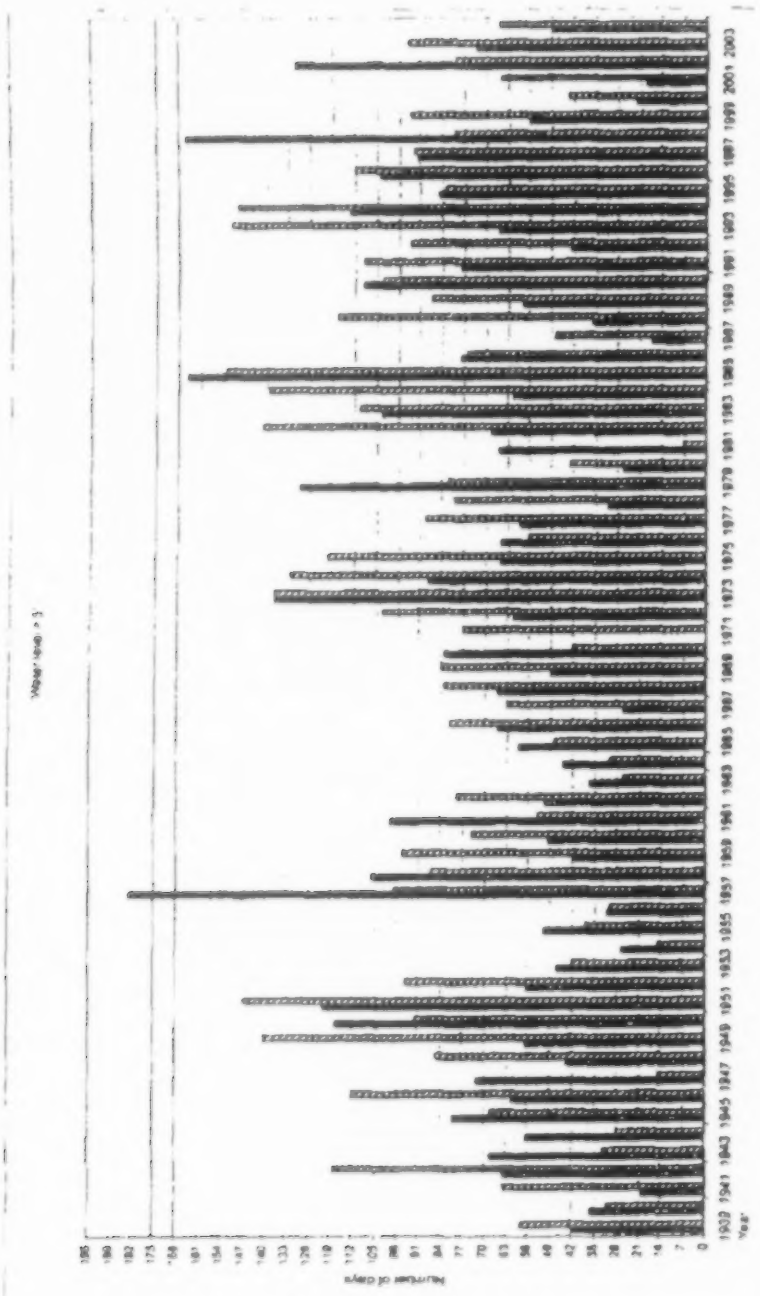


Figure 9. Number of days the Black River was > 6 feet at the Corning, Arkansas gauge during the growing and dormant seasons, 1939-2004.

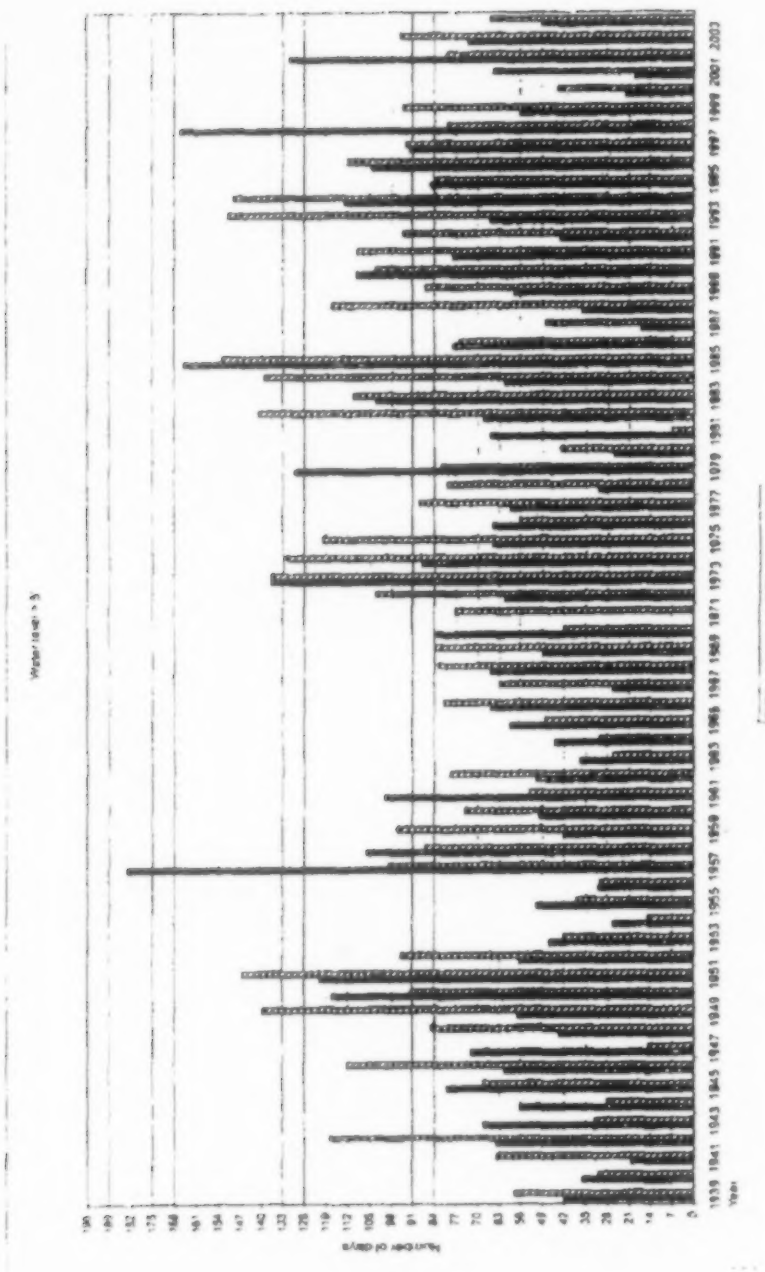


Figure 10. Number of days the Black River was > 5 feet at the Corning, Arkansas gauge during the growing and dormant seasons, 1939-2004.

* * *

may have been saturated for 4-6 months annually. In addition to the co-dominant overcup and Nuttall oaks, other common tree species include green ash, American elm, and water hickory (Appendix 1). Common shrubs in swales include buttonbush and swamp privet. Higher RB-1 areas include scattered willow oak, sweetgum, and shagbark hickory. The forest floor of the lowest elevation areas usually is sparse to bare because of extended flooding. Slightly higher (3-6 inches) areas have greater herbaceous cover dominated by rice cutgrass and poison ivy. Here common privet, honeysuckle, and greenbrier are common understory plants.

High BLH (F-2 and RB-2) habitats historically were flooded for up to a few weeks in most years usually during high flow events of the Black River in late winter and early spring. While these areas may not have flooded in some years, soils usually were saturated for some periods annually. Secondary tree species in these areas included persimmon, sugarberry, Delta post oak, American elm, and green ash (Appendix 1). Understory plants include relatively dense cover of poison ivy, climbing dogbane, and Virginia creeper. Higher elevation natural levees also contained patches of giant cane.

Cypress/tupelo habitats occurred at the lowest elevations in the WMA in low swales, sloughs, and along deeper drainages and old oxbow lakes. These habitats usually have at least 3-4 months continuous flooding duration and soils are saturated almost constantly. This extended flooding supports vegetation that is very water-tolerant, yet these sites need

occasional drying periods for germination of seeds and regeneration of dominant tree communities. Edges of these habitats include buttonbush, water elm, water locust, black willow, and swamp privet (Appendix 1).

BLH ecosystems, such as that found on the Black River WMA, have high primary and secondary productivity (see various chapters in Fredrickson et al. 2005), The heterogenous distribution of BLH habitat types caused by seasonally and annually dynamic flooding regimes, a warm temperate climate, and elevation gradients of point-bar surfaces causes high plant diversity and biomass and strong seasonal pulses of food resources used by diverse animal communities (Fig. 13). BLH habitats are especially dependent on rich detrital bases that support complex nutrient cycling and inter-trophic level food webs (Batema et al. 2005, Heitmeyer et al. 2005). Dense tree cover contributes leaf litter (and other tree parts) to the forest floor that is decomposed by rich fungal, bacterial, and invertebrate communities. Seasonal flooding from late fall through early spring promotes relatively rapid decomposition and pulsed energy flow (Middleton 1999, Batema et al. 2005). Extensive and relatively shallow root systems of BLH trees support fungal filaments and mycorrihizal fungi in top soil layers that conserve and trap nutrients. If detrital layers are reduced, e.g., from prolonged growing season flooding, or extensive tree mortality, then nutrients in BLH systems may be exported from the area and nutrient availability, energy flow, and resource abundance may be greatly reduced. Seasonal, dormant season flooding, especially during slower velocity backwater flood events, imports nutrients and sediments to floodplain areas, however greater water velocities or high sediment loads caused by runoff and

erosion from poorly vegetated upland drainage areas may either scour (high velocity) or deposit excessive sediments and nutrients.

If flooding regimes of BLH floodplain areas, such as in the Black River WMA, are altered (either wetter or drier) then BLH communities will shift to either a wetter or drier type tree species composition (e.g., King 1995, Heitmeyer et al. 2004). At extremes of wetness,

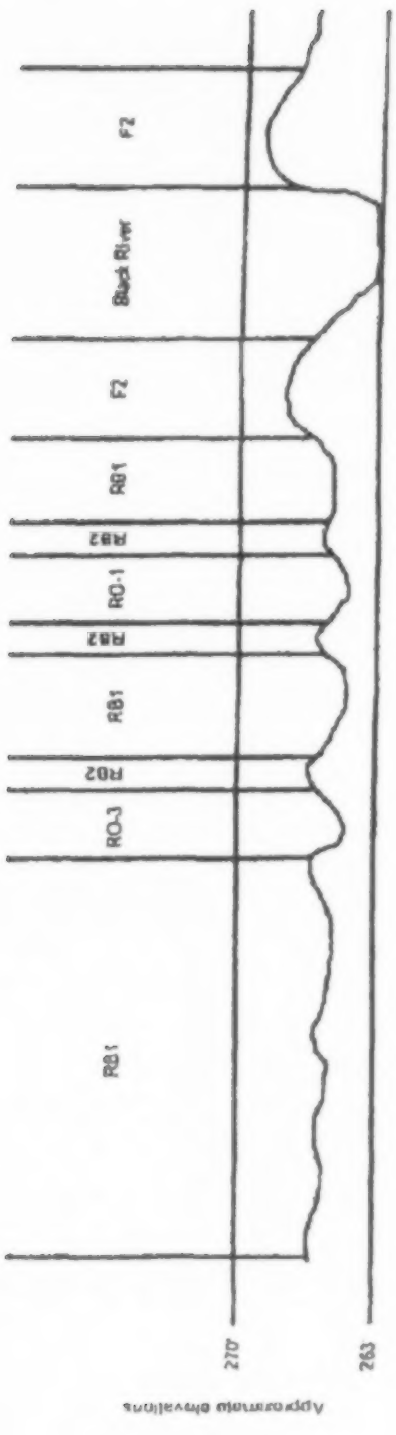


Figure 12. Landscape relationships of hydrogeomorphic habitat types in the Black River floodplain of northeast Arkansas (drawn from SE to NW diagonal transect across Section 11, T19N, R3E). See text for description of habitat types.

prolonged flooding and soil saturation during the growing season occurs and causes less water tolerant species such as willow oak and Nuttall oak to die and be replaced with more water tolerant species such as green ash, water locust, overcup oak and baldcypress. In some low elevation sites communities shift entirely to shrub/scrub or open water habitats. Conversely, extensive drying of a site will shift vegetation to upland-type species.

BLH communities typically are most robust and productive when water flows across floodplains in a broad "sheetflow" manner (Wharton et al. 1982, Middleton 1999, Fredrickson 2005a). The unobstructed flow of water initially travels through floodplains via interconnected sloughs and shallow drainages (such as the numerous sloughs and distributaries on the Black River WMA) and then at higher levels floodwater covers broad flats and low elevations. This "moving" floodwater contains higher oxygen levels than stagnant water conditions (Knight and Blaney 2001) and gently moves many "food" types and nutrients in and across the water column. For example, slowly rising floodwater inundates seeds, acorns, and some moist-soil or terrestrial-type plants along with terrestrial insects that are readily consumed by mallards (Heitmeyer 2006).

ANIMAL COMMUNITIES

BLH ecosystems support one of the richest communities of fish, amphibian and reptile, bird, and mammal species in North America (Heitmeyer et al. 2005). Species distribution and abundance varies across the elevational gradient of BLH habitat types (Appendices 2-5) and many species use all habitat

types at different times of the year depending on timing of flooding and resource availability in the respective areas. Generally, diversity is highest in Low and Intermediate BLH habitats.

Few surveys of abundance of animal populations have been conducted on the Black River WMA, but the limited data available and information from other BLH habitats in the Upper MAV provides a basis for understanding ecological relationships of animals to BLH habitat types, resources, and dynamics (e.g., Holder 1951, AGFC 1998, Heitmeyer et al. 2005). Animals that regularly use BLH ecosystems have many adaptations to seasonal resource availability in floodplains such as on the Black River WMA. Most species are highly mobile, have diverse diets, and capitalize (presence and food use) on pulses of specific foods, especially during seasonal flood events. Omnivory and mobility allow animals to move quickly to sites of new food availability and buffers them from periodic reductions in food, such as during drought or extended flood periods. Many species that use the WMA are present only seasonally. For example, nearly 100 avian species including songbirds, birds-of-prey, shore and wading birds, waterfowl, rail and snipe, and woodpeckers are present only during fall-spring (Appendix 5). Timing of movement to the area/region, and annual events of species, coincide with pulses of specific resources (mostly food) (Fig. 13).

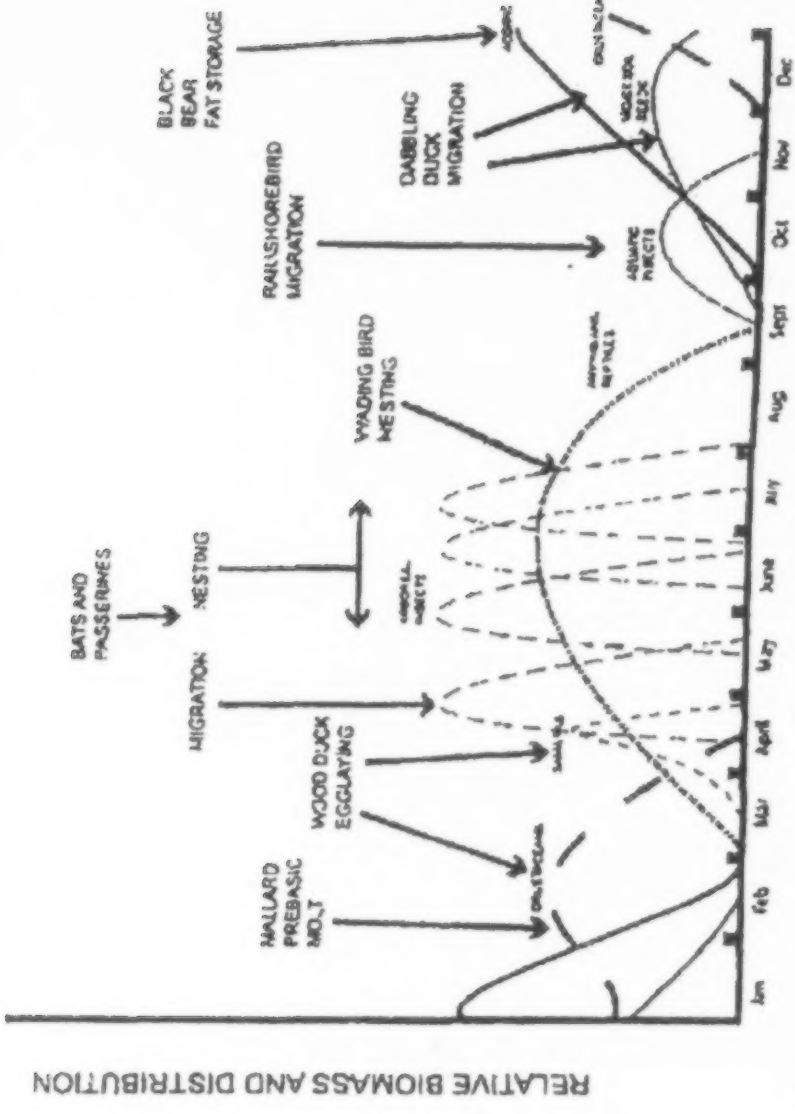


Figure 13. Examples of seasonal pulses of food types in bottomland hardwood forests and key annual cycle events of select wildlife species that coincide with these pulses (from Heitmeyer et al. 2005).

Duck use of BLH habitat in the Black River WMA historically was high from fall through spring. Wood ducks and hooded mergansers breed in the Black River floodplain, and many individuals are present year round. Migrants from northern breeding areas move to this region in winter and swell numbers of local breeders and young-of-the-year. Mallards are the most abundant duck to use the WMA mid-November to late-February. Histori-

* * *

drainage of units occurs in May and early June depending on level of the Black River and spring rainfall. The impoundments are managed for native herbaceous plants using a combination of disturbance and flooding regimes.

Public hunting and fishing is allowed on the WMA, except that Lake Ashbaugh and about 750 acres of BLH in Winchester GTR are designated as waterfowl sanctuary, where no hunting is allowed (except the last 3 days of duck season). A portion of this "Rest Area" has been refuge since the early 1960s, and a triangular-shaped area in the northern part of Section 21 T 21N, R3E, known as the "Dalton Field," had a levee built around part of it in the late-1960s. The Dalton Field is at a higher elevation than most of the surrounding WMA and agricultural crops were grown here in dry years when equipment could be moved to the area. In fall, the lowest elevations of the Dalton Field were flooded through the siphons and occasional direct pumping from the Black River. Subsequent GTR development and difficult and unpredictable access led to abandonment of agricultural production in the

Dalton Field in the early 1970s and levees and water control structures have not been maintained.

SPECIFIC CHANGES ON THE WMA IN THE 1990s

Beginning in 1993, and continuing until 2000, water levels in, and releases from, Clearwater Lake were regulated by a deviated schedule from the previously (1950-1992) authorized plan that sought to keep Black River levels < 11.5 feet from December-April and < 10.5 feet from May-November at the Poplar Bluff gauge. The 1993-2000 deviation also attempted to keep Black River flows < 11.5 feet at Poplar Bluff from December to mid-May, but releases during summer months were regulated by Clearwater Lake levels, instead of the river stage at Poplar Bluff (Fig. 20). This deviation release schedule caused higher flows in the Black River at Corning (and therefore the Black River WMA - see hydrology section above) for extended periods in summer months (Tables 3, 6) (Atoka, Inc. 2001). Specifically, the Black River was > 5 feet at the Corning gauge for an average of 91.2%, 79.0%, and 44.2% of May, June, and July respectively during 1993-1999. In 1999 and 2000, significant deficits in rainfall occurred in southern Missouri and northern Arkansas. Growing season precipitation was > 10 inches below normal in these years and caused lower than normal water levels in Clearwater Lake and lower release rates, which were more like those occurring in pre-1993 periods. Consequently, if the dry year of 1999 is excluded, the percentage of month flooded increased to > 90% of May and June and > 67% of July. On average, deviated flows increased flooding by 7.21 days (34.2%) in May, 6.88 days (40.8%) in June, and 2.79 days (25.5%) in July in 1993-99 compared to 1981-92. It is especially

noteworthy, that most of the increased flooding was at 8-10.5 feet levels, which is a point where all of the BLH on the Black River WMA is flooded except the highest ridge and natural levee elevations. Flooding

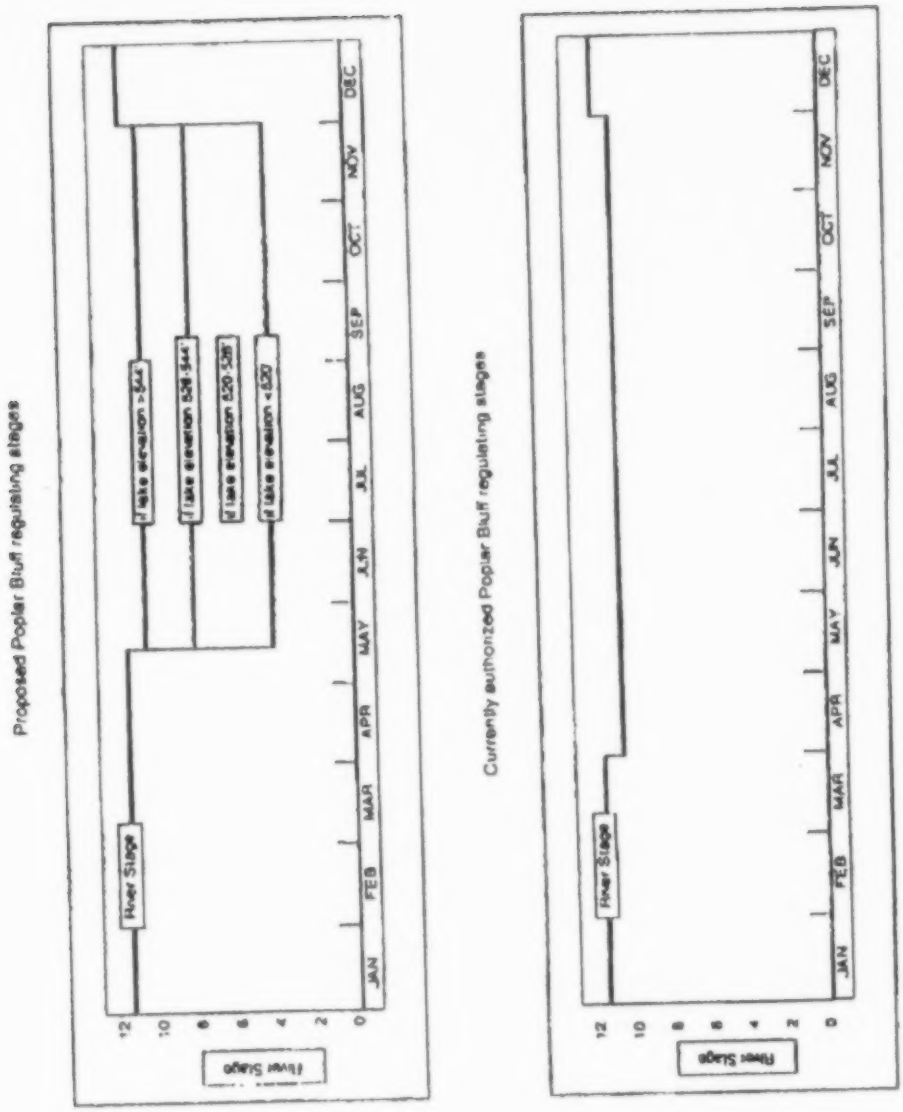


Figure 20. Currently authorized and proposed water release plans for Clearwater Lake.

Table 6. Average days at various Black River gauge heights at Corning, Arkansas.

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
5-6 Feet								
81-92	4.25	2.33	2.25	5.25	1.58	1.33	2.92	1.17
93-99	1.43	2.86	3.14	3.14	0.43	0.29	1.29	0.67
6-8 feet								
81-92	5.00	3.25	4.08	4.75	4.92	4.58	3.58	4.42
93-99	4.57	4.00	6.00	4.43	2.29	4.00	5.43	2.67
8-10.5 feet								
81-92	7.00	7.17	8.83	0.92	0.00	0.08	0.58	5.08
93-99	11.00	12.43	14.14	6.00	1.29	0.43	1.29	5.00
10.5-11.5 feet								
81-92	8.17	7.00	1.67	0.00	0.00	0.00	0.42	1.33
93-99	8.29	6.57	0.43	0.14	0.71	0.00	0.00	1.67
11.5 feet								
81-92	2.50	1.33	0.00	0.00	0.00	0.00	0.33	0.92
93-99	2.71	2.43	0.00	0.00	0.57	0.14	0.29	1.67

was extreme in 1998 when the Corning gauge was > 5 feet for over 90% of the growing season (Fig. 21).

A 5 feet gauge reading at Corning is the point at which surface water begins to inundate the lowest elevations of the Intermediate BLH habitat zone, dominated by Nuttall oak, on the Black River WMA. In May 2005 water levels at the Corning gauge were correlated with water elevations on staff gauges on the WMA (Table 7). These data indicate that a Corning gauge of 5 feet floods > 30% of Nuttall oaks on the WMA. At a 6 feet Corning gauge reading, over 50% of Nuttall oak on the WMA are flooded (Table 7). During 1993-99, the Black River was > 5 feet at Corning for nearly 100 days during the growing season (Fig. 22).

Beginning in the late 1990s, AGFC personnel began noticing increased mortality and evidence of water stress (e.g., tip die-back and basal swelling, see Heitmeyer et al. 2004) of Nuttall oak in the Black River WMA. During October - December 2000, 6 tracts totaling about 6,990 acres of the WMA were investigated using conventional timber inventory and appraisal methods to determine tree species composition and dbh, mortality, tip die-back, understory cover and composition, and other indicators of forest health along with estimation of the value of dead and dying trees (Kingwood 2001a). These data were compared with similar data collected from the same locations by AGFC personnel in the mid-1980s to determine changes. Three of the tracts were in GTRs; two were in low elevations adjacent to, but not in, GTRs and subject only to natural flooding. One tract (in two separate stands) was at a high elevation area that floods only when the Black River is > 8 feet at the Corning gauge.

The October-December 2000 study (Kingwood 2001a) found that much of the BLH, especially Nuttall oak dominated areas, in sampled areas was in a rapid state of decline and degradation, except for the highest elevations that flood only when the Corning gauge is > 8 feet. Mortality of Nuttall oak in areas sampled in 2000 was 20-60% compared to < 3% in the mid-1980s (Kingwood 2001a). Tip die-back was evident in 30-60% of Nuttall oak trees in these areas. Living vegetation in dying stands was predominantly more water tolerant trees (such as overcup oak, baldcypress, and water tupelo), shrubs (such as swamp privet and buttonbush), and obligate wetland herbaceous plants (such as smartweed, arrowhead, sedges, and rice cutgrass). The study concluded that the high, extended period, river levels in the mid 1990s had caused most of the mortality and degradation of the Nuttall oak communities, and timber appraisals indicated the value of the damages to BLH at that time was nearly $5 million. The areas most severely affected by extended flooding were the three GTRs, an area around the Gar Slough drainage, and

Table 7. Correlation of Black River water levels at the Corning, Arkansas gauge (feet) with survey elevations on staff gauges at select points on greentree reservoir (GTR) water control structures on the Black River Wildlife Management Area, and known elevations of Nuttall oak ranges in these GTR areas.

Corning gauge (ft)	Staff gauges	Nuttall oak range
5.4 ft.		
Upper Island	267.3	267.0 - 269.5
Lower Island	267.2	266.5 - 269.0
Upper Reyno	264.7	265.0 - 267.5
Lower Reyno	264.7	264.5 - 267.0
Rest Area	263.2	262.0 - 264.5
6.0 ft.		
Upper Island	267.9	267.0 - 269.5
Lower Island	267.8	266.5 - 269.0
Upper Reyno	265.3	265.0 - 267.5
Lower Reyno	265.3	264.5 - 267.0
Rest Area	263.8	262.0 - 264.5

* * *

PLAINTIFF'S EXHIBIT 506

* * *

Report of Jerry Overton, Ph.D. in the Case of the Arkansas Game and Fish Commission v. United States, 05-381L

May 7, 2008

* * *

FONSI issued by the COE concluded that the "...proposed action would not result in any significant adverse impacts to the human, environmental and natural resources."

The COE somehow concluded that the implementation of the Action Alternative (continued deviation from the authorized plan) would result in beneficial impacts to commercial timber, and that the No Action Alternative (to maintain the current authorized plan) would be adverse to commercial timber. Not only did they ignore the conclusions of the Parsons EA, they clearly quoted the assessment document virtually throughout the FONSI, except for any clear discussion of the impact to the DDWMA and Parsons' conclusions.

AVAILABLE GAUGE DATA

The Arkansas Game and Fish Commission obtained daily river stage readings for Poplar Bluff, Missouri and Corning, Arkansas, and daily Clearwater Lake levels from the COE through 2000. This data provided the basis of ATOKA's comments in a draft report dated

April 27, 2001. These are US Geological Service data sets that can be obtained from the Little Rock District offices (Corning data) and the Rolla, Missouri office (Poplar Bluff and Clearwater Lake data). The Clearwater Lake level readings began on January 1, 1980 and were continuous through November 18, 1999. The Poplar Bluff, Missouri gauge data began on January 1, 1980 and was continuous through November 29, 1999. The Corning, Arkansas gauge data began on December 25, 1980 and was continuous through November 19, 1999.

This data was evaluated by ATOKA to obtain an understanding of the impact of the river stages at various Poplar Bluff and Corning gauge levels. The COE assumption of the relationship between the Poplar Bluff gauge level and the Corning gauge level has been that a gauge level at Poplar Bluff of 4 feet will result, approximately 48 hours later, in a Corning gauge level of 6 feet. It is further assumed by the COE that a Corning gauge level of 6 feet is the level at which inundation of the DDWMA begins. We now know both of these assumptions to be incorrect.

We now know that the relationship between a gauge reading of 4 feet at Popular Bluff results, approximately 48 hours later, in a higher than six-foot gauge level at Corning. We also know that the DDWMA begins to be inundated with a Corning gauge level of 5 feet (discussion with DDWMA personnel, ATOKA, 2001 and Heitmeyer, 2008). The DDWMA personnel have evaluated the relationship between the Corning gauge levels and the point at which inundation of the WMA begins. They have established through their evaluations that at a 5 feet gauge level at the Corning gauge inundation begins within the

WMA (discussions with DDWMA personnel, March 2001).

Dr. Wade Nutter (Nutter, 2008), in his Expert Report, does not specifically refute the DDWMA inundation point being the five-foot gauge level at Corning, rather he acknowledges the ATOKA report (2001) and the COE level of 6 feet, but uses a Corning gauge level of 5.5 feet as the level at which the DDWMA begins to be inundated. Water does not drain from the DDWMA, however, until the Corning gauge level is below five feet. Therefore, when the Corning five-foot gauge level is exceeded, there is flow into the DDWMA. The wildlife management area remains inundated until the Corning gauge level drops below five feet and remains below that level for sufficient time to drain the management area. Dr. Nutter's use of a 5.5-foot Corning gauge level to determine WMA inundation, results in an underestimation of the amount of time that the WMA is inundated. This error affects both the beginning of inundation, the duration of inundation and the time at which water finally drains from the management area. Since most of the COE Expert Reports rely on Dr. Nutter's use of this level, they are also incorrect where this level plays a role in opinions expressed.

One important question, then, is the number of days that the DDWMA is actually inundated due to a Corning gauge level of five feet or greater, during the growing season (April 1 through November 31) each year. Dr. Nutter (Nutter, 2008) compares the observed gauge data for 1993 to 2000 with the Super Model (Southwestern Division Reservoir Regulation Simulation computer Model) generated data that supposedly reflects what would have occurred had no

deviations been instituted. He downplays the number of additional days the WMA is flooded due to the COE deviations. This was pointed out by the COE's Expert Witness Dr. Sammy King (King, 2008) in his Expert Report. King's Table 2 (page 18) and his discussion on page 8 contradict Nutter's inference that the number of additional days the WMA was flooded is insignificant. It is important to note here also, that Dr. King was erroneously basing his discussions on a Corning gauge level of 5.5 foot at which the WMA would begin inundation and below which the WMA would begin to drain. He cited Nutter for this relationship. If he had used the correct relationship of a Corning gauge of 5 feet, perhaps his remarks regarding the length of time and resulting impact on the refuge when it was inundated would have been even more severe.

Using the correct relationship between the Corning gauge and the commencement of draining the WMA, Dr. Nutter (2008) is in error in his conclusion (Conclusion No. 8, page 27) when he states "Duration was extended in most cases less than one week." Based on his own data, and utilizing the commencement of drainage from the WMA when the Corning gauge drops below 5 feet, there are seven years (out of eight possible years) between 1993 and 2000 of more than one week duration, when the actual (observed) length of time that the Corning gauge was above 5 feet, beyond the time that Super Model indicates that the water level should have dropped below 5 foot.

A comparison of actual gauge data from prior to 1993 to 1993 through 2000 by ATOKA (ATOKA, 2001) revealed the actual difference in length of time the DDWMA is inundated. Again, the COE has previously

argued that as the discharge moves downstream, it dissipates to the extent that it does not affect the DDWMA (Nutter, 2008). The gauge data illustrates this not to be the case. Tables 1 and 2 of the 2001 ATOKA Draft Report compare the average days at gauge ranges for Poplar Bluff and Corning for 1981 through 1992 and 1993 through 1999 respectively, for the growing season only. As can be seen from these tables, there is an obvious difference in the duration that the DDWMA is inundated during the growing season between these time peiods. In addition, as was pointed out by Dr. King (King, 2008), this increased inundation strongly predominates in the earliest few months of the growing season, which are the critical months for the survival of the bottomland hardwood forests.

Figures 3 and 4 of the 2001 ATOKA Draft Report, along with their associated tables, show the same relationships discussed in the previous paragraph for Corning. The associated tables show the total number of days of gauge readings greater than five feet for Corning for the two time periods in question. A monthly comparison of the number of days with gauge readings greater than five feet during the growing season, reveals that the duration of inundation due to the deviations from the plan starting in 1993 exceeded the duration of inundation prior to 1993, when the COE followed the authorized plan. Since the months of April through August are critical for maintaining the viability of the woodlands, it is shown that deviation from the authorized plan substantially increased the number of days that the DDWMA was inundated during this period.

In addition to the fact that the deviations to the plan from 1993 through 2000 inundated the DDWMA for more days, especially during the first five months of the growing season, the actual average number of days of inundation during this period was excessive (see Figures 3 and 4, ATOKA, 2001 Report). For the period of deviations from the plan, the DDWMA was inundated an average of 28 days in the month of April. This constitutes an average of 93.3 percent of the month of April inundated each of those years. For the month of May during the years of deviation, the average number of days of inundation was 28.29 days. This constitutes an average of 91.2 percent of the month inundated due to COE deviations to the authorized plan. The month of June had an average of 23.71 days inundated due to the deviation from the authorized plan. This constitutes an average 79 percent inundation during that month. The month of July had an average of 13.71 days inundated due to the deviation from the authorized plan. This constitutes an average 44.23 percent inundation during that month. The month of August had an average of 5.29 days inundated due to the deviation from the authorized plan. This constitutes an average 17.06 percent inundation during that month Comparable figures for the period evaluated during which the COE operated under the authorized plan (1981 through 1992) are: April: 26.92 days / 89.7 percent; May: 21.08 days / 68.0 percent; June: 16.83 days / 56.1 percent, July 10.92 days / 35.23 percent, and August 6.5 days / 20.97 percent.

The deviation from the authorized plan often resulted in prolonged flooding of forest communities in the DDWMA. This inundation extended well into the forest's growing season, and often floodwaters were not

drained from oak stands until mid-to-late-August. The result was that soils on much of the management area remained saturated for 10 to 11 months of the year, and most importantly, for the six months of the growing season from March through August.

The relationship between the Poplar Bluff, Missouri gauge stages and the Corning, Arkansas gauge stages was also addressed by ATOKA in 2001. As stated above, the COE is working under the assumption that there is a direct relationship between the Poplar Bluff gauge and the Corning gauge reading, such that a Poplar Bluff level of 4 feet results in a Corning level of 6 feet. It should also be observed again that the DDWMA drains only when the water level drops to below a 5-foot gauge reading at Corning.

An analysis of the data for the Poplar Bluff gauge and the Corning gauge, and using an average of 48 hours delay between the two gauges, results in a different relationship than assumed by the COE. The data are plotted against each other for the two time periods under evaluation by ATOKA (2001) -- prior to 1993 and from 1993 through 1999. The results of these evaluations are provided in Figures 5 and 6 of the 2001 ATOKA Draft Report. The relationship is a direct correlation expressed in an exponential form rather than a straight line. A visual comparison of the two figures indicates a great deal of similarity between the two time periods. However, if the correlation results are placed in table form, where the Poplar Bluff data constitutes the independent variable and the Corning data constitutes the dependent variable, it is found that a gauge reading at Poplar Bluff results in higher than expected gauge levels at Corning for the period

1993 through 1999, when the COE deviated from the authorized plan (see Tables 3 and 4).

Tables 3 and 4 of the 2001 ATOKA Draft Report also indicated that the direct correlation of a 4-foot gauge level at Poplar Bluff resulted, 48 hours later, in a 6-foot gauge level at Corning is incorrect. Rather a 4-foot gauge level at Poplar Bluff correlates with an expected level of 6.74 foot at Corning according to the 1983 through 1992 gauge data under the authorized plan, and a level of 6.97 at Corning in 1993 through 2000.

It is important to know, based on actual historical data, the level of gauge reading at Poplar Bluff that actually results in a less than 5-foot gauge level at Corning. Again, 5 foot is the level below which the DDWMA will drain. A Corning gauge level higher than 5 foot results in the inundation of the management area. ATOKA (2001) showed that for the period in which the COE operated under the authorized plan prior to 1993, the Poplar Bluff gauge level at which the Corning gauge, 48 hours later, was below 5 foot is 2.4 foot. Under the deviations to the authorized plan beginning in 1993, the gauge level for Poplar Bluff for which the Corning gauge, 48 hours later, was below 5 foot is 2.3 foot. This means that whenever the Poplar Bluff gauge reading is, for an extended period of time (usually two to three days or more) above 2.4 feet, the DDWMA will likely experience inundation.

Since the water level of the river is rising during the period when the Corning gauge level is rising and water is flowing into the DDWMA, the water is flowing more rapidly into the management area than when the Corning gauge drops to below 5 foot and waters recede in the management area. This is primarily due to the

increased hydraulic head from the river during the higher and rising stages as opposed to the lower and receding stages. This means that the DDWMA can flood quickly, but drains slowly.

In summary, the period of deviation from the Clearwater Lake Black River Water Control Plan, when evaluated against the actual historic data collected for the pertinent gauging stations dating back to 1980, results in a greater number of days of inundation of the DDWMA during the growing season. This is especially true for the first five months of the growing season, April through August (discussion with Dr. Jim Baker, April 22, 2008). These five months are critical to the continued growth of the bottomland hardwoods found within the DDWMA. The result of data evaluations is that during the 1993 through 2000 there is an almost continuous inundation of the DDWMA during the months of April, May and June, and for more than an acceptable number of days during July and August.

There is an obvious relationship between the gauge level at Poplar Bluff and the gauge level at Corning. This relationship is different than the relationship assumed by the COE. A gauge level of 4 feet at Poplar Bluff correlates to an expected gauge level of 6.74 feet at Corning (under the authorized plan) or 6.97 feet (under deviations from the authorized plan). This is almost a one-foot difference from the assumed levels used by the COE in their flood routing and other modeling efforts, including the Super Model used by Nutter (Nutter, 2008) and relied on by other

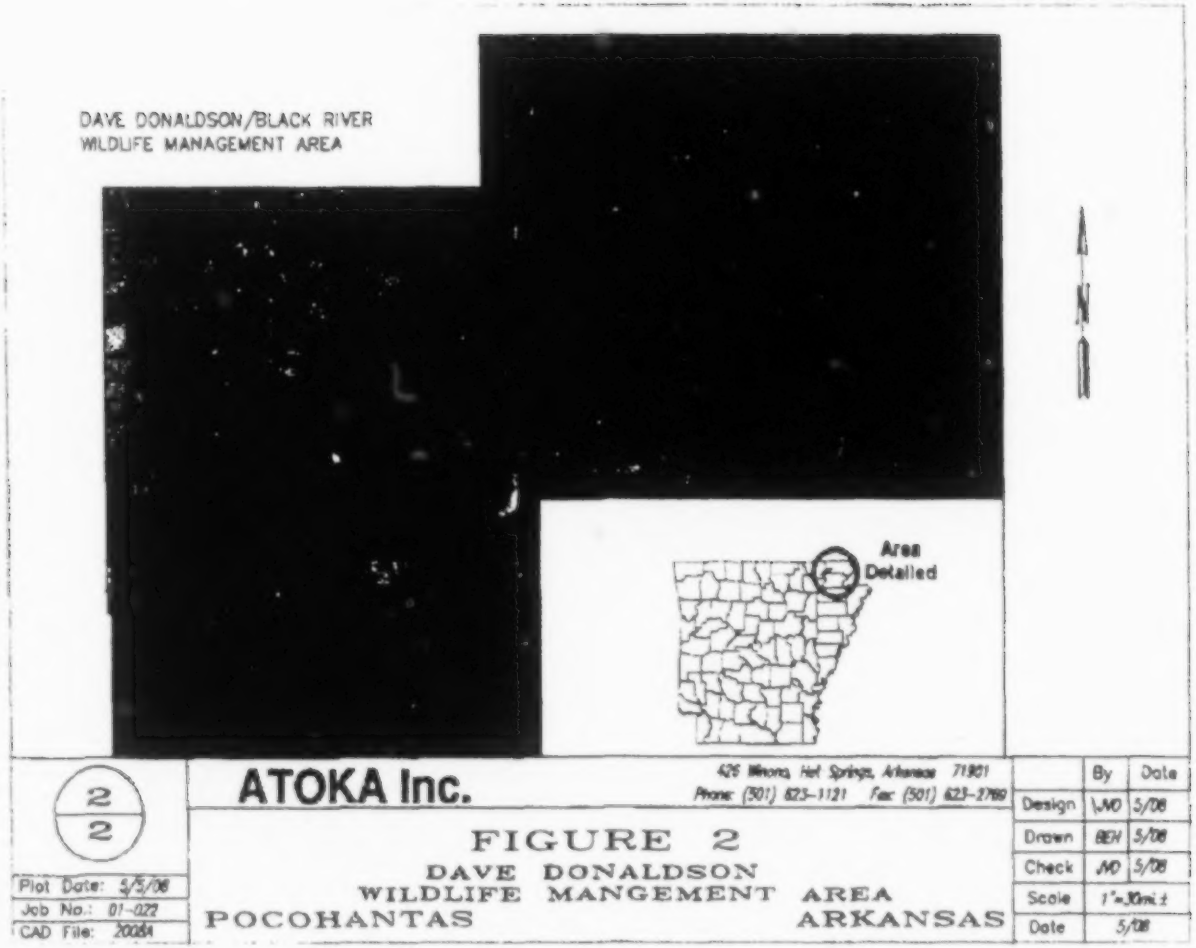
* * *

TABLE 1
POPLAR BLUFF AVERAGE DAYS AT GAUGE HEIGHT

year	gauge (ft)	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
81-92	4 to 6	6.33	3.58	5.67	6.33	4.00	2.33	2.42	6.00
93-99		4.86	5.43	10.40	4.29	3.71	3.57	3.86	6.33
81-92	6 to 8	4.17	3.75	5.83	0.08	0.50	1.67	0.83	2.08
93-99		3.29	7.14	7.86	2.14	0.14	0.00	0.43	2.50
81-92	8 to 10.5	8.00	6.00	0.67	0.00	0.17	0.00	0.08	0.75
93-99		11.00	7.14	0.00	0.14	0.00	0.00	0.00	0.50
81-92	10.5 to	0.50	1.42	0.25	0.00	0.00	0.00	0.08	0.17
93-99	11.5	1.43	1.43	0.00	0.00	0.00	0.00	0.00	0.00
81-92	>11.5	1.50	0.83	0.00	0.00	0.00	0.00	0.08	0.42
93-99		0.86	0.57	0.14	0.14	0.00	0.00	0.00	0.83

TABLE 2
CORNING AVERAGE DAYS AT GAUGE HEIGHT

year	gauge (ft)	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
81-92	5 to 6	4.25	2.33	2.25	5.25	1.58	1.33	2.92	1.17
93-99		1.43	2.86	3.14	3.14	0.43	0.29	1.29	0.67
81-92	6 to 8	5.00	3.25	4.08	4.75	4.92	4.58	3.58	4.42
93-99		4.57	4.00	6.00	4.43	2.29	4.00	5.43	2.67
81-92	8 to 10.5	7.00	7.17	8.83	0.92	0.00	0.08	0.58	5.08
93-99		11.00	12.43	14.14	6.00	1.29	0.43	1.29	5.00
81-92	10.5 to	8.17	7.00	1.67	0.00	0.00	0.00	0.42	1.33
93-99	11.5	8.29	6.57	0.43	0.14	0.71	0.00	0.00	1.67
81-92	>11.5	2.50	1.33	0.00	0.00	0.00	0.00	0.33	0.92
93-99		2.71	2.43	0.00	0.00	0.57	0.14	0.29	1.67



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2

ATOKA Inc.

425 Whiting, Hot Springs, Arkansas 71901
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	By	Date
Design	JMO	5/08
Drawn	BEH	5/08
Check	JMO	5/08
Scale	1"=10mi ±	
Date	5/08	

Plot Date: 5/5/08
Job No.: 01-022
CAD File: 20084

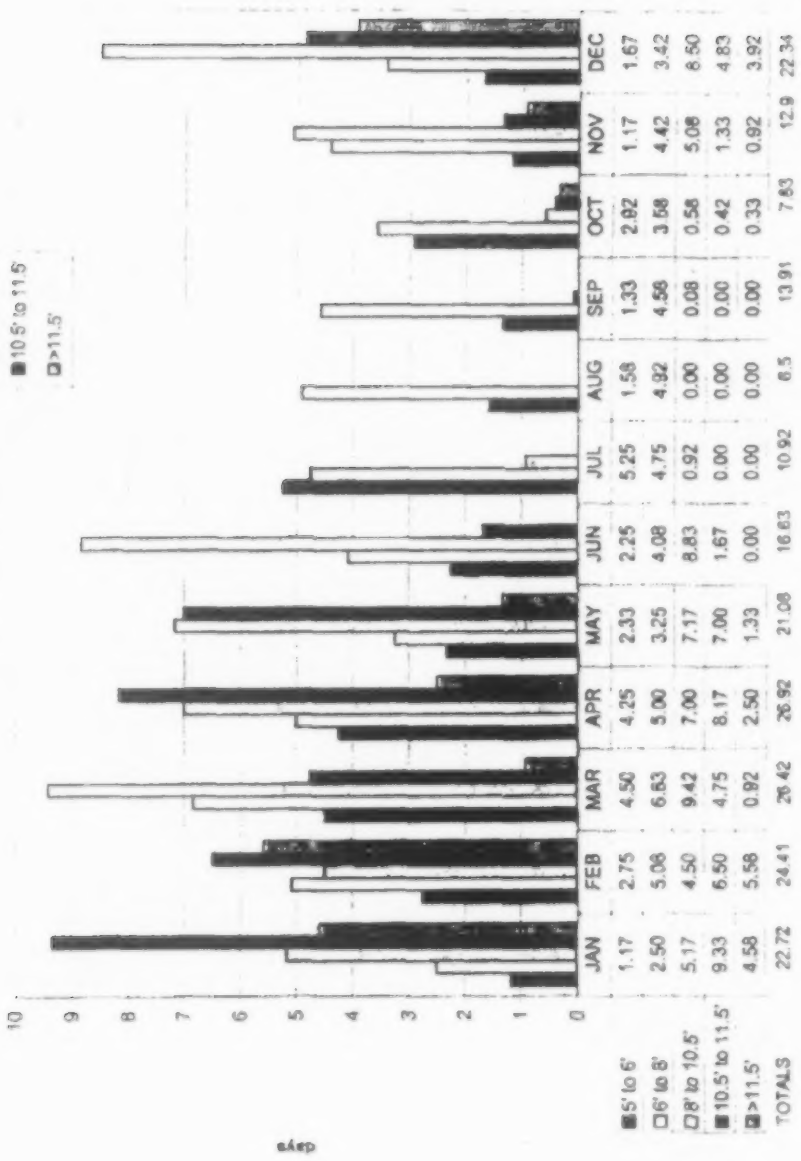
FIGURE 2

DAVE DONALDSON WILDLIFE MANGEMENT AREA

POCOHANTAS ARKANSAS

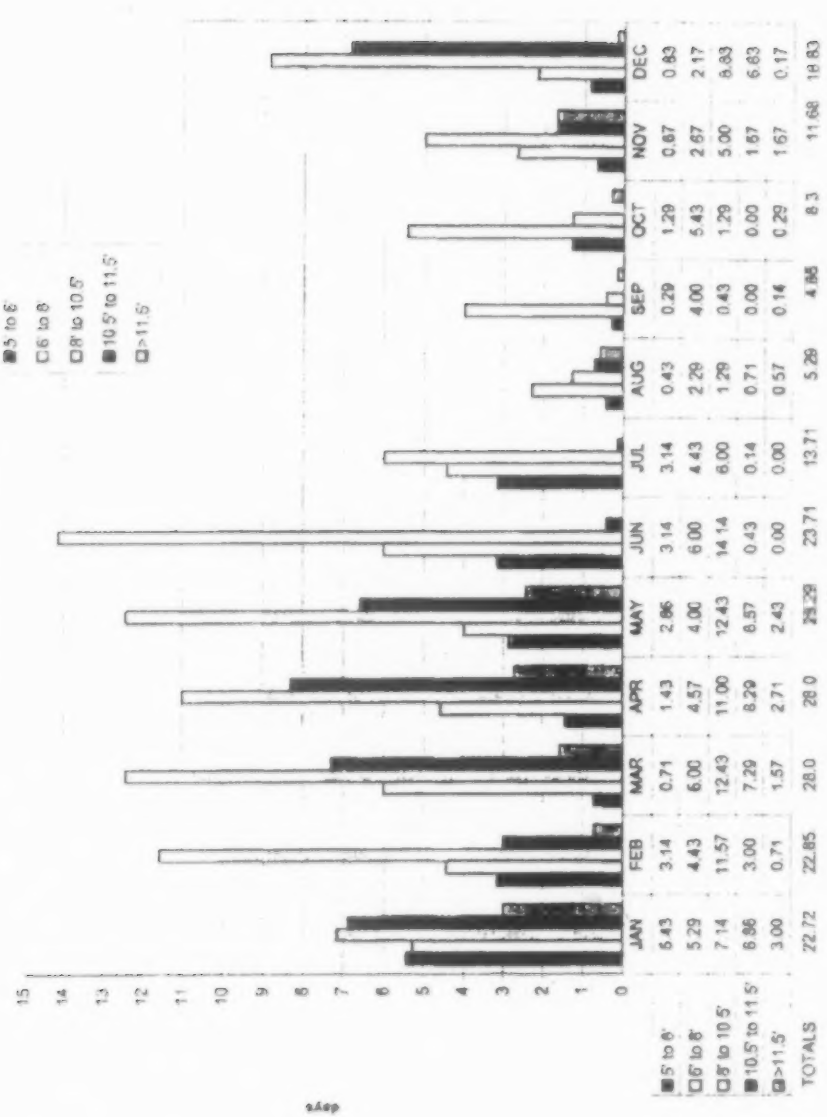
* * *

FIGURE 3
1981-1992
CORNING GAUGE HEIGHTS
AVERAGE DAYS PER MONTH



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
■5' to 6'	1.17	2.75	4.50	4.25	2.33	2.25	5.25	1.58	1.33	2.92	1.17	1.67
□6' to 8'	2.50	5.06	6.63	5.00	3.25	4.08	4.75	4.92	4.58	3.58	4.42	3.42
□8' to 10.5'	5.17	4.50	9.42	7.00	7.17	8.83	0.92	0.00	0.08	0.58	5.08	8.50
■10.5' to 11.5'	9.33	6.50	4.75	8.17	7.00	1.67	0.00	0.00	0.00	0.42	1.33	4.83
■>11.5'	4.58	5.56	0.92	2.50	1.33	0.00	0.00	0.00	0.00	0.33	0.92	3.92
TOTALS	22.72	24.41	26.42	26.92	21.08	16.83	10.92	6.5	13.91	7.83	12.9	22.34

FIGURE 4
1993-1999
CORNING GAUGE HEIGHTS
AVERAGE DAYS PER MONTH



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
5 to 6'	5.43	3.14	0.71	1.43	2.86	3.14	3.14	0.43	0.29	1.29	0.67	0.83	
6' to 8'	5.29	4.43	6.00	4.57	4.00	6.00	4.43	2.29	4.00	5.43	2.67	2.17	
8' to 10.5'	7.14	11.57	12.43	11.00	12.43	14.14	6.00	1.29	0.43	1.29	5.00	8.83	
10.5' to 11.5'	6.86	3.00	7.29	8.29	8.57	0.43	0.14	0.71	0.00	0.00	1.67	6.83	
>11.5'	3.00	0.71	1.57	2.71	2.43	0.00	0.00	0.57	0.14	0.29	1.67	0.17	
TOTALS	27.72	22.85	28.0	28.0	29.29	23.71	13.71	5.29	4.86	8.3	11.68	18.83	

* * *

PLAINTIFF'S EXHIBIT 507

Supplemental Report

Information relevant to determining the effects of U.S. Army Corps of Engineers deviations in water releases from Clearwater Reservoir during 1993-1998 on tree stress and mortality at the Arkansas Game and Fish Commission Dave Donaldson Black River Wildlife Management Area

Mickey E. Heitmeyer, Ph.D.

7 May 2008

Purpose of the Supplement Report

The purpose of this supplemental report is to provide additional information and analyses that help form the scientific basis for my expert opinions in the lawsuit "Arkansas Game & Fish Commission v. United States", 05-381-L (Fed Cl.). This information clarifies certain data and text in the report "Dave Donaldson/Black River Wildlife Management Area Restoration and Management Plan" that I prepared (Heitmeyer 2006) for the Arkansas Game and Fish Commission (AGFC) and analyzes certain comments and information in the United States defense expert witness reports of Nutter, King, Williams, Burak, and Grissino-Mayer. The Heitmeyer (2006) report was written to identify restoration and management approaches and ecological attributes needed to successfully restore and manage bottomland hardwood forest (BLH) habitats and conditions within the Dave

Donaldson/Black River Wildlife Management Area (hereafter Black River WMA).

Scientific Basis for Opinion

Certain of the United States expert reports essentially conclude that not enough information is available to determine if deviations in water releases from Clearwater Reservoir 1993-1998 caused extensive mortality of BLH trees in the Black River WMA (e.g., King, Burak, Nutter 2008). I categorically disagree with this conclusion and present evidence to the contrary that suggest that these deviations did cause mortality and degradations to BLH communities in the Black River WMA.

I base my scientific opinion on information that addresses the following questions/issues:

1. Did deviations in water releases from Clearwater Reservoir increase stage and discharge levels, and cause prolonged flooding, in the Black River and its floodplain at the Black River WMA during the growing season 1993-1998?

2. Did high Black River stages and prolonged growing season flooding cause prolonged inundation and soil saturation in BLH forests on the Black River WMA in 1993-1998?

3. What scientific information exists about the effects of prolonged growing season inundation and soil saturation on BLH tree health, mortality, and resilience?

4. Did BLH trees on the Black River WMA experience mortality and other indicators of water stress during 1993-2000?

5. Did the presence of greentree reservoirs (GTRs) and beaver on the Black River WMA cause the mortality of trees on the Black River WMA during 1993-2000?

Analyses of Information and Conclusions

Question 1. Did deviations in water releases from Clearwater Reservoir increase stage and discharge levels, and cause prolonged flooding, in the Black River and its floodplain at the Black River WMA during the growing season 1993-1998?

Analyses

Hydrological data from the Corning, Arkansas gauge station are used by all parties in this case to determine dynamics in Black River water levels at the Black River WMA. The Corning gauge station is immediately upstream from the Black River WMA and information on river stage (1973-present) and discharge (1939-present) are available to document seasonal and long-term hydrology of the river and its floodplain. All Black River data are readily available from www.usgs.gov. Daily discharge and stage on the Black River at Corning are highly correlated ($r > 0.9$) and discharge is commonly used by the U.S. Army Corps of Engineers (USACE) (e.g., the SUPER models presented in this case) and Heitmeyer (2006) to predict pre-1973 stage levels. Stage level from 1973-present are actual gauge readings at Corning.

Analyses of Corning gauge data, including use of the perhaps biased USACE "SUPER Model," indicate that deviations from Clearwater Reservoir **were responsible** for increased stage and discharge levels in the Black River from 1993 to 1998 (see data in King 2008, Nutter 2008, Overton 2008 expert reports). King and Nutter both analyzed flooding on the Black River WMA when the Corning gauge was above 5.5 feet. The ecologically correct analyses to determine potential flooding of BLH on the Black River WMA would have been to analyze stage data at least above 5.0 feet (Heitmeyer 2006). The 5 foot Corning gauge level is a very conservative measure of when the Black River overflows into extensive areas of BLH on the Black River WMA (see Question #2 below). Further, extended soil saturation under BLH trees on the Black River WMA occurs at depths to 1-2 feet, consequently, even Black River levels > 3 feet at the Corning gauge causes some saturation of root zones of BLH trees, which can degrade their health and cause mortality (see Question #3 below).

Even when a 5.5 foot Corning gauge level is analyzed, King reports that the deviations in water releases from Clearwater Reservoir caused an additional 140 days of flooding > 5.5 feet, 138 days > 6.0 feet, 143 days > 6.5 feet, 128 days > 7.0 feet, 111 days > 7.5 feet, and 101 days > 8.0 feet from 1993 to 1998 (see King 2008, Table 2). These deviations in water releases from Clearwater Reservoir caused increased flooding above 5-8 foot Corning gauge levels in every year 1993-1998; most additional flooding occurred in June and July. The additional flooding caused by these deviations caused the Black River to exceed a 5 foot stage at Corning for at least 65 days during the growing season in every year 1993-98. This flooding > 5 feet for over

65 days during the growing season for 6 consecutive years is the longest consecutive number of years that had this amount of prolonged growing season flooding on record (Heitmeyer 2006: Fig. 10). During 1993-99, the Black River at Corning was > 5 feet for an average of 93.3%, 91.2%, and 79% of April, May, and June, respectively (Overton 2008).

I note that the Nutter report (page 9) identified a printing error in Heitmeyer (2006:14). Figure 10 in Heitmeyer (2006) correctly presents the number of days the Black River was > 5 feet at the Corning gauge during the growing seasons 1939-2004. A corrected Figure 9 that shows number of days the Black River was > 6 feet at Corning is now provided as Exhibit MH-S1. The corrected Figure 9 does not change interpretation of the extensive number of days the Black River WMA was flooded during the growing season, and in fact, further demonstrates the magnitude of this flooding in growing season duration, height of flood waters, and areal surface flooding on the WMA. Collectively, the Corning data indicate that a mean Black River stage of > 5 **and** > 6 feet occurred for over 90 days during the growing season in 1993-98; a mean of five flood pulses in Black River flows exceeded 5 and 6 foot Corning levels during these growing seasons, and the Black River at Corning had an average of 41.26 days and 35.29 days of flooding above 5 and 6 feet in each pulse (Heitmeyer 2006: Table 3).

In summary, the hydrological data from the Black River at Corning clearly prove that deviations in water releases from Clearwater Reservoir from 1993-98 caused the most prolonged > 5 foot stages during the growing season at Corning, AR on record. Deviations

in water releases from Clearwater Reservoir not only caused additional flooding on the Black River WMA at a 5 foot level, but also caused extended flooding that exceeded 6, 7, and 8 feet for over 100 days during the growing seasons 1993-98. Further, when root saturation elevations of > 3 feet Corning gauge levels are considered, the additional flooding caused by deviations in water releases from Clearwater Reservoir ranges from 150-200 days during this period. King's analyses support his conclusion that "... the COE deviations resulted in substantial additional flooding. This flooding would have increased the probability of tree stress and mortality in the absence of GTR management. Flooding occurred for extended periods during some of the hottest months which would have increased tree stress because of reduced dissolved oxygen."

Conclusion

The extensive data analyzed by all experts in this case clearly demonstrate that the deviations in water releases from Clearwater Reservoir caused unprecedented high prolonged water levels in the Black River WMA during the growing seasons 1993-1998.

* * *

PLAINTIFF'S EXHIBIT 575

[logo]
US Army Corps
Of Engineers
Little Rock District

News Release

Release No. 20-01 **Contact: P.J. Spaul**

For Release: **Phone: (501) 324-5551**
Immediately

Downloadable District news is available at http://www.swl.usace.army.mil/news&info/newsrel.html on the World Wide Web.

CORPS TO USE ORIGINAL WATER CONTROL PLAN FOR CLEARWATER LAKE

LITTLE ROCK, Ark., April 9—Because of potential for damage to bottomland hardwoods in the Dave Donaldson Black River Wildlife Management Area, the Army Corps of Engineers will use the original water control plan for Clearwater Lake at Piedmont, Mo., instead of a proposed new plan. The Corps has scheduled two public workshops this month to explain the situation.

The first workshop will begin at 6:30 p.m. April 25 at the Black River Coliseum at 301 S. 5th Street in Poplar Bluff, Mo. The second will begin at 6:30 p.m.

April 26 at the Randolph County Development Center on the Black River Technical College campus in Pocahontas, Ark.

Officials will start the workshops with a short presentation about the situation. Following that, tables will be manned by Corps and Arkansas Game & Fish Commission officials where attendees can ask questions one-on-one.

For years, farmers who plant low-lying acreage downstream of Clearwater Dam sought and were granted numerous deviations from the water control plan.

Because of these repeated requests, the Corps' Little Rock District began working with interest groups and government agencies to develop a new water control plan for the 52-year-old Clearwater Lake that more closely matches the needs of today's basin users. Representatives of these interests joined together to form the Clearwater Lake/Black River Committee.

– MORE –

In 1998, the committee unanimously endorsed an alternative water control plan to aid the farmers downstream of the lake along the Black River. By late 1999, a draft environmental assessment was completed and sent to other agencies for comment.

In response, the Arkansas Game & Fish Commission furnished data that indicates the proposed plan may have significant impacts to bottomland hardwoods in the Dave Donaldson Black

River Wildlife Management Area. AGFC asked the Corps to return to the original water control plan. The two agencies agreed to conduct some tests to see what affect the proposed new plan would have on the hardwoods, however, extended drought made the tests impossible.

Then earlier this year, appropriate water conditions finally occurred. Corps personnel were able to visit the wildlife management area and confirm that significant amounts of tree roots were flooded and could, under certain conditions, remain flooded long enough to damage or destroy the trees at the regulating stages under the new plan.

Since the new plan could cause significant changes to the environment of the wildlife management area, the National Environmental Policy Act blocks its implementation unless an Environmental Impact Statement is prepared to ensure adequate environmental safeguards are put in place. Corps and AGFC officials met March 30 and agreed to return to the original regulating plan until further studies can be funded and better solutions found.

Under this plan, the Corps will regulate releases to a river stage of 11.5 feet at Poplar Bluff from December 1 until March 31. From April 1 through November 30 (the agricultural season) the regulating stage at Poplar Bluff will be 10.5 feet. Requests for deviation from this regulating plan will be considered on a case-by-case basis and will require review by AGFC.

–MORE–

The new plan that was shelved called for a four-foot stage during the growing season to keep water off bottomland farms. However, the four-foot stage inundates the roots of the hardwood trees in the wildlife management area.

In general, Clearwater Lake reduces widespread downstream flooding by trapping large amounts of water during heavy rains. This water is then released in a controlled fashion (according to the water control plan) over an extended period of time, thus reducing downstream flood crests.

The lower the operating stage that is used to empty this water from the lake, the longer it takes to release it all. Thus, AGFC prefers the higher operating stage. The tree roots get wet either way, but with the higher stage, the releases are completed sooner. Even though the water gets deeper, there is less chance of tree damage.

For more information, write the Little Rock Engineer District, Attn: Planning Branch, P.O. Box 867, Little Rock, Ark. 72203-0867. Send e-mails to *Roger.C.Hicklin@usace.army.mil.*

DEFENDANT'S EXHIBIT 285

PLANNING

[logo]
US Army Corps
of Engineers
Little Rock District

CLEARWATER LAKE
BLACK RIVER, MISSOURI

WATER CONTROL MANUAL

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT,
CORPS OF ENGINEERS
ARKANSAS

JULY 1995

* * *

II - DESCRIPTION OF PROJECT

2-01. Location. Clearwater Dam is located on the Black River at river mile 257.4 in Reynolds and Wayne Counties in southeastern Missouri. The dam lies about 32 miles northwest of Poplar Bluff, Missouri. Clearwater Dam regulates the flow from 898 square miles of drainage area. A watershed map for the Black River Basin is shown on Plate 2-01. The project location and vicinity maps are shown on Plate 2-02.

2-02. Purpose. The Clearwater Lake project was authorized for flood control and other purposes. Storage is allocated for flood control and a permanent conservation pool is provided for recreation and wildlife. The lake also provides a permanent conservation pool for recreation and wildlife and serves as a component of the White and Lower Mississippi River Basins' flood control and water resources development plan.

* * *

2-05. Real Estate Acquisition. Clearwater Lake's acquisition guide contour equals the dam's spillway crest elevation, 567.0 feet NGVD. The frequency of filling the reservoir to this elevation is approximately once in 37 years (based on simulated reservoir operations, SUPER Model Run 93X05, for the period of record 1940-1986). The COE purchased reservoir land in fee to a blocked perimeter that encompasses the acquisition guide contour. Total fee acreage as of 1993 covers 18,606 acres, which reflects an increase of several acres over the initial land acquisition. In a real estate memorandum dated 19 August 1958 the COE increased the easement contour from 567.0 feet NGVD to 572.0 feet NGVD to encompass small areas of land outside the reservoir boundaries that were subject to inundation. Total easement acreage as of 1993 covers approximately 113 acres which reflects an increase of several acres over the original easement acreage. The Government property line is indicated on Plate 2-12, the General Development Plan.

In 1978, the COE issued the Missouri Department of Conservation a 25-year license to use 12,659 acres of land and water in the Clearwater Lake area for

conservation and management of fish and wildlife. In 1984 the COE granted a request to increase the acreage to 15,853 acres.

* * *

III – HISTORY OF PROJECT

3-01. Authorization. Following a serious flood in 1937 the Flood Control Act of 1938 authorized construction of six projects in the White River Basin: Clearwater Lake in Missouri, Water Valley and Norfork Lakes in Missouri and Arkansas, and Lone Rock, Greers Ferry, and Bell Foley Lakes in Arkansas. Section 4 of the Flood Control Act of 1944 authorized the development of COE projects for recreational purposes. The Clearwater Lake project was authorized for flood control and other purposes storage is allocated for flood control and a permanent conservation pool is provided for recreation and wildlife. Although the project has no authorized water supply storage, it does maintain a continuous minimum release of 150 cfs when possible. This was the historical minimum flow at the dam site prior to construction and was an amount agreed to as a water supply for the city of Poplar Bluff, Missouri.

* * *

IV – WATERSHED CHARACTERISTICS

4-01. General Characteristics. The Black River rises in the Ozark Plains of southeastern Missouri and flows southerly to enter Clearwater Lake. The Black River Basin contains an area of about 8,558 square miles, with 898 square miles situated upstream of

Clearwater Dam (Plate 2-01). While the river is about 290 miles long from its mouth to where it splits into three forks, the basin has a length of about 150 miles with a width of about 90 miles. The average stream slope upstream of Corning, Arkansas is 3.6 feet per mile (feet/mile) (USGS, 1987). Elevations in the basin range from about 656.0 feet NGVD at the convergence of the East, Middle, and West forks of the Black River to 328.0 feet NGVD at Poplar Bluff, Missouri and to 278.0 feet NGVD at Corning. Plate 4-01 shows the Black River profile from Clearwater Dam to Corning. The only major populated area within a 75-mile radius of the dam that may be affected by high water is Poplar Bluff, approximately 45 river miles downstream of the dam. No major highways provide direct access to Clearwater Lake, but four U.S. highways (60, 160, 67, and 62) are within a 100-mile radius of the lake and may be affected by high water.

* * *

4-09. Channel and Floodway Characteristics.

a. Headwater to Clearwater Dam.

(1) The Black River rises in the Ozark Plateau about 100 miles south of St. Louis, Missouri. The upper reaches of the West, Middle, and East Forks of the Black River flow through one area of the Mark Twain National Forest. The East Fork of the Black River is the site of the lower structure and reservoir for Union Electric's Taum Sauk pumped storage hydroelectric power facility. The upper reservoir (4,500 acre-feet capacity) sits at the top of Proffit Mountain. The lower structure is about 5 miles from Lesterville, Missouri in Reynolds County and about 15 miles upstream from Clearwater Lake. The lower structure has a drainage area of approximately 88 square miles

and has a capacity of 6,350 acre-feet at full pool. Flow of the river downstream of the lower dam is essentially unaffected by the project. The Taum Sauk project went into commercial operation in late 1963. Additional information is given on the Taum Sauk project in paragraph 4-10.

(2) Clearwater Dam is located at river mile 257.4 on the Black River and has a drainage area of 898 square miles. The dam is located about 32 miles northwest of Poplar Bluff, Missouri. The inflow gage for Clearwater Lake is near Annapolis, Missouri (population 400), at river mile 278.5, with a drainage area of 484 square miles. The average flow at this gage is 593 cfs, with the maximum recorded flow being 98,500 cfs in 1985 and the minimum flow being 65 cfs in 1965 (USGS 1991b). The National Weather Service (NWS) flood stage at Annapolis is 8.0 feet. The discharge rating curve for the Annapolis gage is shown on Plate 4-18. The U.S. Geological Survey (USGS) also maintains a streamflow gaging station on the East Fork of the Black River at Lesterville. This gage has a drainage area of 94.5 square miles and an average flow of 120 cfs. The maximum recorded flow was 35,800 cfs in 1985; there has been no flow at times (USGS 1991b). The watershed above the dam is mainly wooded and generally steep and rocky. The average slope of the Black River upstream of Annapolis is 10.9 feet/mile (USGS 1968).

b. Clearwater Dam to Poplar Bluff. This reach of the Black River extends from river mile 257.4 to 211.2. The only major population center in this reach is Poplar Bluff (population 16,790). Poplar Bluff marks the point where the Black River leaves the hills of southeast Missouri and enters the flat alluvial plain.

There are two USGS streamflow gaging stations in this reach: Black River at Leeper, Missouri and Black River at Poplar Bluff (USGS 1992b). The gage at Leeper has a drainage area of 987 square miles (89 square miles uncontrolled) and an average controlled flow of 974 cfs. The maximum recorded flow was 78,400 cfs in 1983; the minimum flow was 62 cfs in 1966. The average stream slope of the Black River between the dam and Leeper is 8.5 feet/mile (USGS 1968). The gage at Poplar Bluff has a drainage area of 1,245 square miles (347 square miles uncontrolled) and an average controlled flow of 1,325 cfs. The maximum recorded flow at Poplar Bluff was 65,600 cfs in 1982; the minimum flow was 180 cfs in 1966. The average stream slope upstream of Poplar Bluff is 6.2 feet/mile (USGS 1968). The NWS flood stage at Poplar Bluff is 16 feet. The discharge rating curve for the gage at Poplar Bluff is shown on Plate 4-19. Flow rates in excess of about 3,800 cfs on the Black River between Clearwater Dam and Poplar Bluff cause the groundwater flow from the river to flood basements of houses and septic tank tile fields. Recently the reach of river between Clearwater Dam and Poplar Bluff has become a popular canoeing area. In 1993 an obstruction removal project was completed on the Black River between the dam and Poplar Bluff to improve conditions for recreational boating and as a minor flood control measure. The project increased conveyance in the reach by 200 to 300 cfs.

c. Poplar Bluff to Corning.

(1) This reach of the Black River extends from river mile 211.2 to 152.2. The Coon Island Wildlife Refuge is along the Black River in Butler County between Poplar Bluff and the Missouri-

Arkansas state line. Land use in the refuge is 65 percent row cropping and 35 percent hardwood timber.

(2) Several levees have been built to protect adjacent lands from flooding in this reach (Plate 2-01). The right bank area of the Black River in and around Poplar Bluff is protected by a levee and numerous interior drainage structures in the Butler County Drainage Districts. These projects, in conjunction with Clearwater Lake, provide flood protection in the Poplar Bluff area to approximately 400 acres of urban land and over 300 acres of agricultural land. All of the levees in Butler County jointly protect several thousand acres. The Butler County Drainage District No. 12 levee in East Poplar Bluff, Missouri is patrolled at Poplar Bluff stages above 16 feet; the approximate overtopping stage is 24 feet at the Poplar Bluff gage. The Reorganized Butler County Drainage District No.7 levee is also patrolled at Poplar Bluff stages above 16 feet; approximate overtopping stage is 19 feet at Poplar Bluff. The North Inter-River Drainage District also maintains a levee along the left bank of the Black River from just above Poplar Bluff to about river mile 185. The North Inter-River Drainage District levee is also patrolled at stages above 16 feet at Poplar Bluff; the approximate overtopping stage is 18 feet at Poplar Bluff. The South Poplar Bluff levee has an overtopping stage of 22 feet at the Poplar Bluff gage. The city of Poplar Bluff is still susceptible to flooding from flood waters rounding the ends of the levees. U.S. Highway 60, east of Poplar Bluff, and Missouri State Highways 53 and 142 southeast of Poplar Bluff are subject to flooding. U.S. Highway 60 floods when the Poplar Bluff gage reaches 20 feet, Missouri State Highway 53 floods when the Poplar Bluff gage reaches 17 feet, and Missouri State

Highway 142 floods when the Poplar Bluff gage reaches 16 feet.

(3) Channel improvement work, consisting of clearing and snagging, to reduce agricultural flooding along the Black River from 6 miles south of Poplar Bluff to the Missouri-Arkansas state line was approved under Section 205 of the Flood Control Act of 1948, as amended.

(4) The only stream gage in the reach is a USGS gage at Corning, Arkansas (population 3,540). The gage at Corning has a drainage area of 1,749 square miles and an average flow of 1,845 cfs. The maximum recorded flow at Corning was 48,600 cfs in 1945; the minimum flow was 224 cfs in 1941. The NWS flood stage at Corning is 15 feet. The average stream slope upstream of Corning is 3.6 feet/mile (USGS 1987). The discharge rating curve for the gage at Corning is shown on Plate 4-20.

d. Downstream of Corning.

(1) Several tributaries enter the Black River in this reach including the Current River (river mile 96.2); the Spring River (river mile 72) and its tributary, the Eleven Point River; and the Strawberry River (river mile 32.7). Two cities border the Black River in this reach: Pocahontas, Arkansas (population 6,060) and Black Rock, Arkansas (population 790). The USGS gage at Black Rock has a drainage area of 7,369 square miles and an average flow of 8,616 cfs (USGS 1991a). The maximum recorded flow at Black Rock was 190,000 cfs in 1982; the minimum flow was 1,730 cfs in 1956 (USGS 1991a). The NWS flood stage at Black Rock is 14 feet. The NWS also publishes a flood stage at Pocahontas, Arkansas of 17 feet. In this

lower reach of the river, stages can be influenced by high water on the White River.

(2) Two wildlife management areas are located along the banks of the Black River in this reach. The Dave Donaldson-Black River Wildlife Management Area covers 19,500 acres of bottomland and hardwood wetlands along both sides of the river from just downstream of Corning, Arkansas to just upstream of the confluence of the Current River (about river miles 142 to 100). The Black River runs through the Shirey Bay-Rainey Brake Wildlife Management Area upstream of the confluence of the Strawberry River (approximately river miles 42 to 47).

(3) Most of the flooding along this reach is agricultural flooding near Black Rock. Flood protection from the Black River along this reach includes several levees and levee Districts. The Central and Western Clay County Drainage Districts' levees provide flood protection from the Missouri-Arkansas state line south for 12.3 and 20.3 miles, respectively. These levees are all patrolled at stages above 18 feet at Corning; the approximate overtopping stage for these levees is 22 feet at Corning. The Big Gum Levee District operates and maintains an 8.3 mile stretch of levee on the left bank of the Black River near Corning. The Big Gum levee on the left bank is also patrolled at Corning stages above 18 feet; the approximate overtopping stage is 22 feet at Corning. Upstream of Pocahontas, Arkansas the Running Water Levee District has 8.5 miles of levee protecting 14,000 acres of farm land on the left bank of the Black River near Skaggs Ferry (river miles 103 to 95). Patrolling begins at this levee when 31.5 feet at Pocahontas. Another small protection project is located on the right

bank of Curia Creek just upstream of its confluence with the Black River (about Black River river mile 32), which is operated and maintained by the Curia Creek Drainage District. The Curia Creek levee is patrolled above stages of 26 feet at Black Rock; the approximate overtopping stage is 28 feet at Black Rock. County roads located in the Curia Creek area are subject to flooding from Curia Creek.

* * *

4-12. Economic Data.

* * *

d. Flood Damages. Approximately one-half of the estimated flood losses in the Black River Basin occur between the dam and the state line with the remaining losses occurring downstream of the state line. A major portion of the direct flood losses in the valley results from damage to crops. Indirect losses consist of interruption of traffic and inconvenience and delay incurred while isolated by floods (U.S. Highway 60 and Missouri Highways 53 and 142 are subject to inundation). Crop losses are highly seasonal, ranging from a relatively small amount in the winter to a complete loss just prior to harvest in late summer and fall. This variation in the seasonal loss is the main reason for establishing lower operating stages on the river in the growing season. Higher operating stages in the winter tend to increase the storage space available in the reservoir for regulating spring and summer floods, but they must be set low enough to conform to low elevations of roads and to prevent land erosion. Cumulative losses prevented for Clearwater Dam and Poplar Bluff levee exceed $85,000,000 and $5,000,000,

respectively. Table 4-11 shows the damages prevented by the dam and the Poplar Bluff levee over the last 10 years (1982 through 1992). Plates 4-21 through 4-23 show the acres inundated in the three reaches below the dam

TABLE 4-11
LOSSES PREVENTED AT CURRENT PRICES
(in $1.000)

FY	Poplar Bluff Levee[1/]	Clearwater Reservoir
1982	390.00	5,240.00
1983	1,097.00	15,831.00
1984	0.00	2,268.00
1985	385.00	16,046.00
1986	0.00	10,259.00
1987	0.00	0.00
1988	2.00	1,241.00
1989	0.00	1,780.00
1990	0.00	1,883.56
1991	85.60	2,870.10
1992	0.00	2,775.02
Cumulative through 1992	5,120.00	85,321.68

[1/] Modified flows are used to compute losses prevented by the levee since it was built after the Clearwater Reservoir was built.

e. Recreation. Table 4-12 lists the number of visitors, average annual benefits, and fees collected for

Clearwater Lake from 1983-1992. Black River Basin recreation has become a vital part of the area's economy, both in attracting tourists and the retirement population. The COE has developed several beaches. Also located on the lakes are commercial boat dock concessions where boat rental, boat storage, and other recreational supplies are available. The Black River Basin also includes portions of the Mark Twain National Forest and three wildlife management areas (WMA) (Plate 2-01). All three WMAs are below Clearwater Lake; one in Missouri and two in Arkansas. Based on COE information for 1993, the most common recreation uses at Clearwater Lake are sightseeing, boating, fishing, and picnicking. Visitors also swim, camp, water ski, and hunt.

TABLE 4-12
CLEARWATER LAKE RECREATION

Year	Visitors	Average Annual Benefits[1]	User Fees Collected[2]
1983	953,000	4,765,000	90,800
1984	1,017,000	5,085,000	121,600
1985	920,000	4,600,000	107,400
1986	1,065,000	5,325,000	127,000
1987	987,700	4,938,500	126,800
1988	1,070,800	5,354,000	128,400
1989	672,500	3,362,500	153,500
1990	768,600	3,843,000	134,200
1991	967,200	4,836,000	158,800
1992	902,200	4,511,000	161,300

[1] Benefits calculated as $5/visitor in 1993 dollars; benefits cover costs and O&M of the project and are separate from fees collected.

[2] User fees collected represent actual fees collected for a given year.

* * *

VII - WATER CONTROL PLAN

7-01. General Objectives. The primary purpose of Clearwater Dam is to provide flood protection below the dam and to maintain a permanent conservation pool for recreation, fish and wildlife, and other incidental uses.

7-02. Constraints.

a. Upstream. The conservation pool at Clearwater Lake is elevation 494.0 feet NGVD. A summer seasonal pool provides for raising the conservation pool to elevation 498.0 feet NGVD on 1 May. The transition from conservation pool to seasonal pool depends on where the lake level is prior to 1 May and whether there is any evidence of or the potential for a fish spawn. Elevation 498.0 feet NGVD is maintained through May. On 1 June, about the beginning of the mosquito season, the pool is gradually drawn, with cyclical fluctuations, to elevation 496.5 feet NGVD on 15 September. The pool is then finally drawn to elevation 494.0 feet NGVD on 8 October. After 8 October the pool is held constant until 1 May except as required for flood control. The Project Rule Curve, or seasonal conservation pool level, is shown on Plate 7-01.

b. Downstream.

(1) Septic Tanks. Sustained releases in excess of 3,800 cfs result in the infiltration of field lines and septic tanks of residences located on the left bank between one-half and one mile below the dam.

(2) Water Supply. A minimum continuous release of 150 cfs is maintained at Clearwater Dam. This was the observed minimum flow at the dam site prior to construction and is used for downstream water supply for the cities of Poplar Bluff and Piedmont, Missouri. Paragraph 7-09 discusses water supply in more detail.

(3) Agricultural Considerations. During the agricultural season, deviations from the normal regulation plan have often been approved due to

agricultural needs between Poplar Bluff and the Missouri-Arkansas state line. Regulating stages of 5 to 6 feet at Poplar Bluff are typical of those deviated to during times when crops are being planted and harvested. Also, sustained releases at the Poplar Bluff regulating stage level may extend the duration of time that the Inter-River Drainage District area cannot be drained by gravity flow through its flood gates. To compensate for the blockage of drainage, a pumping station and other works were installed by the Corps of Engineers in 1952 with the assurance the drainage district would be responsible for operation and maintenance at no cost to the federal government. In 1983, the Inter-River Drainage District experienced flooding in the leveed area and did not run the pumps due to lack of funds. Only the lower lands within the leveed area need the pumps to remove internal drainage. Therefore, the drainage district has attempted to reorganize and to exclude this portion, thereby not requiring the pumps. Presently, this issue is unresolved but remains a problem when extended high releases from Clearwater are required. In 1987, the Inter-River Drainage District reorganized into two districts: the North Inter-River Drainage District and the Ring Levee Drainage District.

(4) Highways Subject to Flooding. Between the dam and Poplar Bluff, several roads could be threatened by flooding: Highways HH, 34, O, W, and NN. Highway HH would be flooded in the event of a spill. Table 7-01 indicates highways that are subject to flooding.

TABLE 7-01
HIGHWAYS SUBJECT TO FlOODING[1/]

Highway	Location	Gaging Station Data			
		River	Location	Bankful Stage (feet)	Inundating State (feet)
U.S. Hwy. 60	East of Poplar Bluff	Black	Poplar Bluff	11.0	20.0
Missouri Hwy. 53	Southeast of Poplar Bluff	Black	Poplar Bluff	11.0	17.0
Missouri Hwy. 142	Harviell-Poplar Bluff	Black	Poplar Bluff	16.0	

[1/] Source: Natural Disaster Response Plan (OM 500-1-1, August 1991), Little Rock District, U.S. Army Corps of Engineers.

7-03. Overall Plan for Water Control.

a. General. Clearwater Lake is regulated to reduce flooding on the Black River. No special regulation schedules for reducing flooding on the White or Mississippi Rivers are provided for. Norfork lake on the North Fork River and Beaver, Table Rock, and Bull Shoals Lakes on the upper White River are operated as a system to regulate stages on the White River at Newport, Arkansas. Newport is downstream of the mouth of the Black River; therefore, releases from Clearwater could effect the stages at Newport. However, the expansiveness of the uncontrolled area contributing to the flow/stage at Newport, combined with a travel time from Clearwater Dam to Newport of approximately 8 days, makes it impractical to operate Clearwater Dam based on conditions at Newport. Therefore, Clearwater is operated independently of the other White River Lakes. During critical flood periods on the Mississippi River, the Mississippi River

Commission will be furnished river and reservoir data as required so that the effect of controlling flows in the upper Black River will be available if circumstances require special action. Any special regulation schedule to aid the Mississippi River must be based on a deviation for the circumstances at the time.

b. Purpose. The principal goals of the Clearwater regulation plan are to

(1) Provide for maximum flood crest reduction at Poplar Bluff above the operating stages;

(2) Provide for maintaining releases below the level where appreciable overflow of cleared land begins during the agricultural season; and

(3) Provide for maintaining releases during the nonagricultural season somewhat above the level where overflow begins but below levels where extensive overtopping of banks and resulting erosion occurs and below levels that obstruct traffic on public roads.

c. Simulation of Plan. The Southwestern Division's reservoir simulation computer model, SUPER, was used to simulate the daily operation of Clearwater Lake for a 47-year period of record, 1940 through 1986. A description of the model and its capability can be found in Exhibit C. Input to the model included observed intervening mean daily inflows to Clearwater Lake and at the downstream control point, Poplar Bluff. Mean daily lake releases were controlled by setting the regulating stage, or capacity, of the downstream control point. The regulating capacity was input to change with the

season. Releases from the project were computed in the model based on a perfect forecast knowledge of the next 2 days of intervening flow at the control point. This perfectly known 2-day flow was followed by a recession, which was extrapolated for each subsequent day, of 50% of the previous day's flow. This extrapolation extended for 20 days during each iteration of release calculations.

7-04. Standing Instructions to the Damtender. Instructions for reservoir regulation are issued by the Reservoir Control Section In the event communication with the Little Rock District Office is disrupted, the damtender should regulate the project in accordance with the schedule of regulations for flood control operations, instructions in this chapter, and Exhibit D of this manual. Additionally, the Project Manager will immediately make every effort to reestablish communications with the District Office. If the Project Manager or damtender needs to make a change from the directed releases for any reason, the Reservoir Control Section will be notified immediately.

7-05. Flood Control.

a. Normal Regulation. Clearwater Lake is regulated to reduce flooding on the Black River. Releases during floods are scheduled so that the combined flow from the uncontrolled area and releases from the reservoir are maintained at the planned operating stages at Poplar Bluff. The crests of rises from the uncontrolled area reach Poplar Bluff about 48 hours after the beginning of surface runoff. The average time for the effect of water released at the dam to first reach Poplar Bluff is 21 hours and the average time for the full effect is about 60 hours. However, after 48 hours there is little change in flow;

therefore, a time of travel of 48 hours is used. When the predicted peak discharge from the uncontrolled area at Poplar Bluff is less than the regulating discharge, flood pool evacuation releases may be started 21 hours before the predicted crest. When the predicted peak discharge from the uncontrolled area is greater than the regulating discharge, flood pool releases may be started 21 hours before the uncontrolled discharge recedes to the regulating discharge. The amount to release at any time is determined by subtracting the uncontrolled flow expected to occur at Poplar Bluff 48 hours after the proposed gate change from the regulating discharge. Poplar Bluff gage data, when not available on the WCDS, may be interrogated via telephone at (314) 785-1099. The gage at Annapolis may also be interrogated via telephone at (314) 598-3895 to obtain an indication of inflow into Clearwater Lake. Additionally, the NWS in St. Louis, MO, provides public forecasts for both Poplar Bluff and Annapolis. This forecast may be obtained at telephone number (314) 447-1887. Channel characteristics, including travel times of releases from the dam to Poplar Bluff, are discussed in paragraph 4-09. Plate 7-01 contains the conservation level target pool elevations during the year. The Poplar Bluff seasonal regulating stages are shown on Plate 7-02. The following conditions govern the regulation of Clearwater Lake.

(1) Pool Level Above Conservation Pool and Below Spillway Crest. When the water surface of the lake is above seasonal conservation pool (Plate 7-01) and below the spillway crest, elevation 567.0 feet NGVD, the following rules apply:

(a) During Agricultural Season. During the agricultural season, April through November, releases are made to a regulating stage of 10.5 feet at Poplar Bluff. A stage of 10.5 feet corresponds to a flow of approximately 3,500 cfs.

(b) During Nonagricultural Season. From December through March the regulating stage is 11.5 feet at Poplar Bluff. A stage of 11.5 feet corresponds to a flow of approximately 4,000 cfs. If the intervening flow between the dam and Poplar Bluff is less than about 570 cfs, the regulating stage of 11.5 feet is impossible to maintain with a maximum release of 3,800 cfs. In emergency situations, releases higher than 3,800 cfs may be made despite the problems with the septic tank flooding. These emergency situations will be evaluated by the Hydraulics and Hydrology Branch on a case-by-case basis. In any case, releases that would produce stages higher than 11.5 feet at Poplar Bluff require prior approval as a deviation to this plan.

(2) Pool Level at or above Spillway Crest. When the water surface of the lake exceeds or is forecasted to exceed the spillway crest, elevation 567.0 feet NGVD, the following rules apply:

(a) Pool Exceeds or is Forecasted to Exceed Spillway Crest Elevation 567.0 feet NGVD. When the pool exceeds or is forecasted to exceed the spillway crest, regulate the tunnel outlet gates to obtain as much crest stage reduction as possible at Poplar Bluff above a stage of 12.0 feet. The full-time tunnel releases may be more than adequate to maintain the lake level below elevation 574.0 feet NGVD on the basis of the predicted inflows. In this

case, releases will be scheduled to utilize the available storage to elevation 574.0 feet NGVD to obtain the greatest crest stage reduction possible at Poplar Bluff above a stage of 12.0 feet. By trial computations, with the predicted flows upstream and downstream from the dam, the available storage space in the reservoir may be scheduled to most effectively benefit the downstream areas.

(b) Pool Forecasted to Exceed Elevation 574.0 feet NGVD. When the reservoir level is forecasted to exceed elevation 574.0 feet NGVD using the above rule, try to prevent that elevation from being exceeded by increasing the conduit releases to the practicable limit based on potential for benefits and damages for both downstream and upstream conditions existing at the time. When the reservoir level has crested and the uncontrolled spillway release begins to recede, the controlled release is maintained to regulate to stages of 10.5 feet and 11.5 feet at Poplar Bluff.

(3) Backwater Effects. Backwater profiles shown on Plate 7-03 will serve as a guide to indicate the magnitude of backwater in the lake under different conditions. There are some improved properties in the surcharged storage zone of the lake but the exact elevations of these properties are not known. Observations of flooding as the pool rises into this zone will be made by the Resident Office personnel. Allowances may be made for the backwater curve in the lake, but any changes to the regulation for backwater will be evaluated on a case-by-case basis. Any changes in the regulation procedures that are deemed necessary will be initiated only after receiving approval from the Southwestern Division Office.

(4) Routine Releases. Gate 2 may be used for discharges up to about 1,500 cfs. Either Gates 1 and 3 or Gates 1, 2, and 3 should be used for discharges greater than 1,500 cfs, with the gates having equal openings. Releases should be reduced gradually beginning about 2 days prior to emptying the flood control pool to prevent bank caving along the Black River that may result from rapidly receding stages.

If no rainfall index number or instructions to the contrary have been received when rain begins at the dam or is reported for downstream stations, reduce releases to 150 cfs at a rate not to exceed 2,000 cfs per hour as stated in paragraph 7-16. Most of the time, an index number will be supplied to the damtender by the RCS regulator. When the average rainfall between the dam and Poplar Bluff exceeds the index number, runoff begins to occur and the releases from Clearwater must be decreased to avoid exceeding regulating stages at Poplar Bluff. When an index has been given, reduce releases in accordance with Table 7-02 when rainfall occurs at the dam. For example, if the release before the rain begins is 3,500 cfs and the index number is 0.8 inches, when 0.9 inches of rain has fallen at the dam, then it is assumed that 0.1 inches of rainfall in excess of the index has occurred between the dam and Poplar Bluff. The release should be reduced to 3,400 cfs, which is the permissible release for 0.1 inches of excess rainfall (see Table 7-02). If the rainfall continues and 1 hour later the storm total rainfall is 1.0 inch (a rainfall excess of 0.2 inches) the release should be reduced to 3,250 cfs. As the rain continues, the release should also continue to be reduced in accordance with Table 7-02.

(5) Example of Normal Regulation. An example of a typical flood control operation follows with computations shown in Table 7-03, Example of Normal Regulation. Conditions prior to the rainfall event are: no rainfall has occurred for a considerable time prior to this event; Clearwater Lake is at conservation level, elevation 494.0 feet NGVD, sustaining a minimum release of 150 cfs; the flow at Annapolis is 200 cfs; the flow at Poplar Bluff is 500 cfs (a base flow of 350 cfs plus the minimum release of 150 cfs). The storm event produced a uniform rainfall of 2.9 inches over the upstream and downstream portions of the basin. As shown on Plate 6-02, Surface Runoff Estimated from Rainfall, the index prior to the storm event was 1.0 inch resulting in runoff amounts of approximately 1.3 inches above the dam and 1.0 inch below the dam. Tables 6-01 and 6-02, Runoff Hydrographs for Area Upstream of Annapolis for Natural Flow at Clearwater Dam Site and Runoff Hydrographs between Annapolis and Clearwater Dam for Natural Flow at Clearwater Dam Site, respectively, are used to compute the total inflow hydrograph into Clearwater Lake using a runoff amount of 1.3 inches. Table 6-05, Runoff Hydrographs for Intervening Area Flow at

TABLE 7-02

REDUCTION IN RELEASES BASED ON INDEX NUMBER AND RAINFALL

Rainfall [1/] excess (inches)	Release from Dam prior to storm (cfs)									
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	Permissible release (cfs)									
0.1	450	950	1450	1900	2400	2900	3400	3900	4400	4950
0.2	300	800	1300	1800	2300	2800	3250	3750	4250	4750
0.3	150	650	1150	1650	2150	2650	3100	3600	4100	4550
0.4	150	500	1000	1500	2000	2500	2950	3450	3900	4300
0.5	150	300	800	1300	1800	2300	2800	3250	3700	4100
0.6	150	150	600	1100	1600	2100	2600	3050	3450	3850
0.7	150	150	400	900	1400	1900	2400	2850	3250	3600
0.8	150	150	200	700	1200	1700	2150	2650	3000	3350
0.9	150	150	150	400	950	1450	1900	2400	2750	3100
1.0	150	150	150	150	700	1200	1650	2150	2500	2800

Rainfall [1] excess (inches)	Release from Dam prior to storm (cfs)									
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	Permissible release (cfs)									
1.1	150	150	150	150	400	900	1400	1900	2250	2500
1.2	150	150	150	150	150	600	1100	1600	2000	2250
1.3	150	150	150	150	150	300	800	1300	1700	2000
1.4	150	150	150	150	150	150	500	1000	1400	1700
1.5	150	150	150	150	150	150	200	650	1050	1400
1.6	150	150	150	150	150	150	150	350	700	1100
1.7	150	150	150	150	150	150	150	150	350	750
1.8	150	150	150	150	150	150	150	150	150	400
1.9	150	150	150	150	150	150	150	150	150	150

[1] Rainfall excess = actual rainfall less index amount.

TABLE 7-03
EXAMPLE OF NORMAL REGULATION

Date	Time	Poplar Bluff flow forecast (cfs)	Clearwater inflow (cfs)	Clearwater release (cfs)	Clearwater elevation (feet NGVD)
Apr 1	0600	530	760	150	494.2
	1200	780	3,780	150	495.3
	1800	1,240	9,830	150	498.1
	2400	1,840	20,660	150	503.1
Apr 2	0600	2,700	24,320	150	508.0
	1200	3,400	14,740	150	510.6
	1800	3,840	8,820	1,500	511.8
	2400	4,100	6,550	1,500	512.7
Apr 3	0600	4,050	5,290	1,500	513.3
	1200	3,720	4,410	1,500	513.7
	1800	3,370	3,650	1,500	514.1
	2400	3,020	3,280	1,500	514.4

Date	Time	Poplar Bluff flow forecast (cfs)	Clearwater inflow (cfs)	Clearwater release (cfs)	Clearwater elevation (feet NGVD)
Apr 4	0600	2,670	2,770	1,500	514.6
	1200	2,340	2,390	1,500	514.8
	1800	2,080	2,140	1,500	514.9
	2400	1,880	1,760	1,500	515.0
Apr 5	0600	1,720	1,510	1,500	515.0

Poplar Bluff, is used to compute the uncontrolled runoff hydrograph at Poplar Bluff using a runoff amount of 1.0 inch. The Poplar Bluff flow forecast combines the uncontrolled runoff with the base flow and project discharge prior to the storm event. This computation reveals a crest discharge at Poplar Bluff of approximately 4,100 cfs at midnight on 2 April. The recession indicates the regulating discharge of 3,500 cfs will occur between 1200 and 1800 hours on 3 April. Releases should begin 21 hours before this time and fully reach Poplar Bluff 48 hours later, between 1800 and 2400 hours on 4 April. Because the flow at that time will be between 1,880 cfs and 2,080 cfs, an initial release of 1,500 cfs should be made to sustain the regulating discharge of 3,500 cfs. Subsequent computations are made for future releases based on the travel time and flow recession.

b. Action to Be Taken at the Project Office When a Storm Occurs. When a storm occurs, the Project Office should follow the instructions given in Table 7-04.

TABLE 7-04
WHEN A STORM OCCURS

Lake Stage Conditions at Start of Storm	Regulations - Clearwater Lake
Flood control pool at or above elevation	Await instructions from the Reservoir Control Section before making any flood control releases. The Reservoir Control Section will furnish the

Lake Stage Conditions at Start of Storm	Regulations - Clearwater Lake
494 feet NGVD	schedule for flood control releases as soon as possible. If no rise results from the storm, continue the regulations as described in paragraph 7-05a and Exhibit D, paragraph 1.
Flood control releases in use below the spillway crest (elevation 567 feet NGVD)	The Reservoir Control Section will routinely furnish an index number to be used with Table 7-02 which indicates how much to reduce releases during a storm. If a storm begins when flood control releases are being made and no instructions to the contrary have been received from the Reservoir Control Section, releases will be reduced to 150 cfs at a rate not to exceed 2,000 cfs per hour. Thereafter, report the action taken to the Reservoir Control Section during regular duty hours, or to the Reservoir Control Section project regulator during non-duty hours. If radio and telephone service is inoperative, drive to the nearest telephone where service is available. If connections still cannot be made, reduce releases to 150 cfs until connections are made unless rapid pool rises require releases in compliance with the emergency release criteria of Plate 7-04.

Lake Stage Conditions at Start of Storm	Regulations - Clearwater Lake
Pool elevation approaching the spillway crest (elevation 567 feet NGVD)	Communicate with the Reservoir Control Section immediately. Reports are made to the Reservoir Control Section during regular duty hours, or to the Reservoir Control Section project regulator or the Chief, Reservoir Control Section, during nonduty hours. If normal communication with the District Office fails, try to phone from a nearby town. If communication cannot be established, send the information to Little Rock by automobile. If data cannot be collected by any other means, drive to Annapolis, Poplar Bluff, and other nearby stations and collect the river stage and rainfall data. Refer to Plate 7-04, Release Required to Limit Pool to Elevation 574 feet NGVD, with the observed pool elevation rise during the last 2 hours and determine the tunnel releases that are required. If necessary, adjustments to the tunnel releases should be made immediately. This emergency regulation is the only case where flood control releases are increased without prior instructions from the Reservoir Control Section. The Reservoir Control Section will furnish pool predictions for warning residents in the reservoir area.

c. Emergency Regulation. Should communication with the District Office be disrupted, the Project Manager or designated responsible staff will, on their own initiative, direct regulation of the reservoir in accordance with Table 7-05 until communication is restored. In addition, the Project Manager will immediately make every effort to reestablish communication with the District Office. Use of Table 7-05 will require the Project Manager to implement a surcharge operation according to Plate 7-04 if the pool is rising at rapid rates and is above elevation 560.0 feet NGVD.

TABLE 7-05
EMERGENCY REGULATIONS -
CLEARWATER LAKE

Lake Stage Conditions at Start of Storm	Emergency Regulations - Clearwater Lake
Flood control pool at or above elevation 494 feet NGVD	If no rise results from the storm, continue the regulations as described in paragraph 7-05a and Exhibit D, paragraph 1.
Flood control releases in use below the spillway crest (elevation 567 feet NGVD)	Monitor rapid pool rises to determine required releases in compliance with the emergency release criteria of Plate 7-04.
Pool elevation approaching the spillway	Refer to Plate 7-04, Release Required to Limit Pool to Elevation 574 feet NGVD, with the observed pool

Lake Stage Conditions at Start of Storm	Emergency Regulations - Clearwater Lake
crest (elevation 567 feet NGVD)	elevation rise during the last 2 hours and determine the tunnel releases that are required. If necessary, adjustments to the tunnel releases should be made immediately. This emergency regulation is the only case where flood control releases are increased without prior instructions from the Reservoir Control Section.

7-06. Recreation. The upper Black River is a clear spring-fed stream and the permanent lake is popular for fishing, boating, swimming, and picnicking. A master plan for recreational purposes and land management for Clearwater Lake was prepared in cooperation with the National Park Service, U.S. Public Health Service, the Missouri Department of Conservation, and the Missouri State Health Department in order that the best possible use could be made of the lake area.

The Corps of Engineers has established six parks around the lake; three include commercial boat dock concessions. The boat docks provide boats and motors, boat storage, fish bait, soft drinks, and other allied services. All parks have been or will be provided with public use facilities, including picnicking and camping facilities, water supply, launching ramps, and sanitary facilities. These facilities are being expanded each year to meet increasing recreational demands. The river

below the dam is used for boating and canoeing. Park sites are shown on Plate 2-12.

7-07. Water Quality. Not applicable.

7-08. Fish and Wildlife. Not applicable.

7-09. Water Supply. Clearwater has no water supply storage, however, a minimum continuous release of 150 cfs is maintained as long as possible without depleting the conservation pool. This was the observed minimum flow at the dam site prior to construction and is used for downstream water supply for the cities of Poplar Bluff and Piedmont, Missouri. On occasions the continuous minimum release of 150 cfs cannot be maintained. On these occasions, the deviation procedures described in paragraph 7-13 should be followed and the cities of Poplar Bluff and Piedmont should be alerted. It is the responsibility of the Resident Engineer to coordinate these operations wi th the cities of Piedmont and Poplar Bluff to minimize the negative effects on water supply. If the stage at Poplar Bluff is forecast to drop below 0.3 feet due to a special operation at Clearwater, the city of Poplar Bluff should be alerted. At stages lower than 0.3 feet, Poplar Bluff may have difficulty with their water supply. The RCS will assist the Resident Engineer by providing stage forecasts for Poplar Bluff when necessary.

7-10. Hydroelectric Power. Not applicable.

7-11. Navigation. Not applicable.

7-12. Drought Contingency Plan. A Drought Contingency Plan has been developed to provide a basic reference for water management decisions and

coordination at COE lakes in response to drought induced water shortages in conformity with existing regulatory requirements. The plan identifies foreseeable operational and physical problems that would result from attempting to meet user needs under such circumstances. Recommendations for operational changes and deviations to the Water Control Plan are specified in the Drought Contingency Plan, along with other actions that the COE can take to improve regulation during low flow periods. The Drought Contingency Plan is Appendix V to the White River Basin Water Control Master Manual.

Two periods of severe drought have occurred in the Black River Basin in recent history. The period from 1952 through 1956 was the worst drought ever recorded in the basin with respect to both intensity and duration. Clearwater Lake was able to maintain normal minimum releases during the drought period. The lake fell to an elevation of 493.18 on 24 October 1956, but had recovered to conservation pool elevation (494.0) by 8 November 1956. The other major drought occurred in the Black River Basin from late 1962 through the middle of 1964. The lake fell to a minimum elevation of 493.24. on 16 November 1994, but recovered to conservation pool elevation by 3 December 1964.

7-13. Flood Emergency Action Plan. Studies have been made to determine the possible downstream flood conditions and inundated areas which could exist in the event of a large project release caused by a dam failure. Results of these studies and actions to be taken are contained in the Clearwater Dam Operation and Maintenance Manual, Volume II, Flood Emergency Plan, May 1983. The plan contains the

notification requirements and details the signs of distress to look for and the actions to be taken. The project monitoring requirements are laid out with the appropriate responsibilities. Resources available for use in an emergency are listed. The plan delineates the downstream areas which may be affected by a breach of the structure and gives the arrival time and time to peak of the flood waters.

7-14. Mosquito Control. From 1 June through 15 September the lake will be regulated to aid in the control of mosquitos. The Project Rule Curve on Plate 7-01 illustrates the mosquito control operation. This is a 7-day cyclical operation wherein the pool is drawn a maximum of 0.5 foot during the first 3 days then permitted to rebound to within the limits of the rule curve over the final 4 days. This cycle begins 1 June and is maintained through 15 September if inflows permit. Should the inflow to Clearwater Lake recede to less than 150 cfs, the pool will be drawn along the rule curve without fluctuation. The rules for mosquito control operation are as follows.

a. Inflow Is 250 cfs or Greater. Draw the pool a maximum of 0.5 foot over a 3-day period. Over the next 4 days store 100 dsf, approximately 200 acre-feet, each day allowing the pool to rise 0.4 foot, to the upper limit of the rule curve. The net loss in pool elevation over the 7-day period is 0.1 feet.

b. Inflow Less Than 250 cfs. Draw the pool over a 3-day period a minimum that will permit raising the pool back to the rule curve in about 4 days, storing all the inflow in excess of 150 cfs. In other words, the amount the pool may be drawn is 0.1 foot less that the

amount the pool would recover during the 4 days of minimum releases, based on inflow at the time.

c. Inflow Is 150 cfs or Less. Draw the pool along the top of the rule curve without fluctuation.

7-15. Deviation from Normal Regulation. The District Engineer is occasionally requested to deviate from normal regulation of the lake. Prior approval is required from the Division office for subsequent action, except as noted in the subparagraph below. Deviation requests usually fall into the following categories.

a. Emergencies. Some emergencies that can be expected include drowning and other accidents, or failure of operation facilities. Necessary action under emergency conditions is taken immediately unless such action would create equal or worse conditions. The Division office is informed as soon as practical. A written confirmation, showing the deviation and conditions, will be furnished to Southwestern Division Engineering Division, Water Resources (SWDED-WR) on Southwestern Division Form 898.

b. Unplanned Minor Deviations. There are unplanned instances that create a temporary need for minor deviations from the normal regulation of the lake although they are not considered emergencies. Construction accounts for the major portion of these instances and includes utility stream crossings, bridge work, and major construction contracts. Changes in releases are sometimes necessary for maintenance and inspection. Requests for changes of release rates are generally for a few hours to a few days. Each request is analyzed on its own merits. Consideration is given to upstream watershed conditions, potential flood

threat, condition of the lake, and possible alternative measures. In the interest of maintaining good public relations, the requests are complied with, providing there are no adverse effects on the overall operation of the project for the authorized purposes. Approval for these minor deviations will normally be obtained from Southwestern Division by telephone. A written confirmation showing the deviation and conditions will be furnished to SWDED-WR on Southwestern Division Form 898.

c. Planned Deviations. Each condition should be analyzed on its merits. Sufficient data on flood potential, lake and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes will be presented by letter, telephone, or facsimile to the Southwestern Division along with recommendations for review and approval.

(1) Agricultural Purposes. Regulating stages of 5 feet to 6 feet at Poplar Bluff have been used when crops between Poplar Bluff and the Missouri-Arkansas state line are being planted and harvested. Typically, requests from the area farmers for deviations to the normal regulating plan are made during early spring, late summer, and early fall. This operation requires a deviation from the Water Control Plan.

(2) Recreation. Planned deviations may also include special releases for recreation on the Black River such as canoe and raft races and fishing events. Any special operation for recreation requires a deviation to the Water Control Plan.

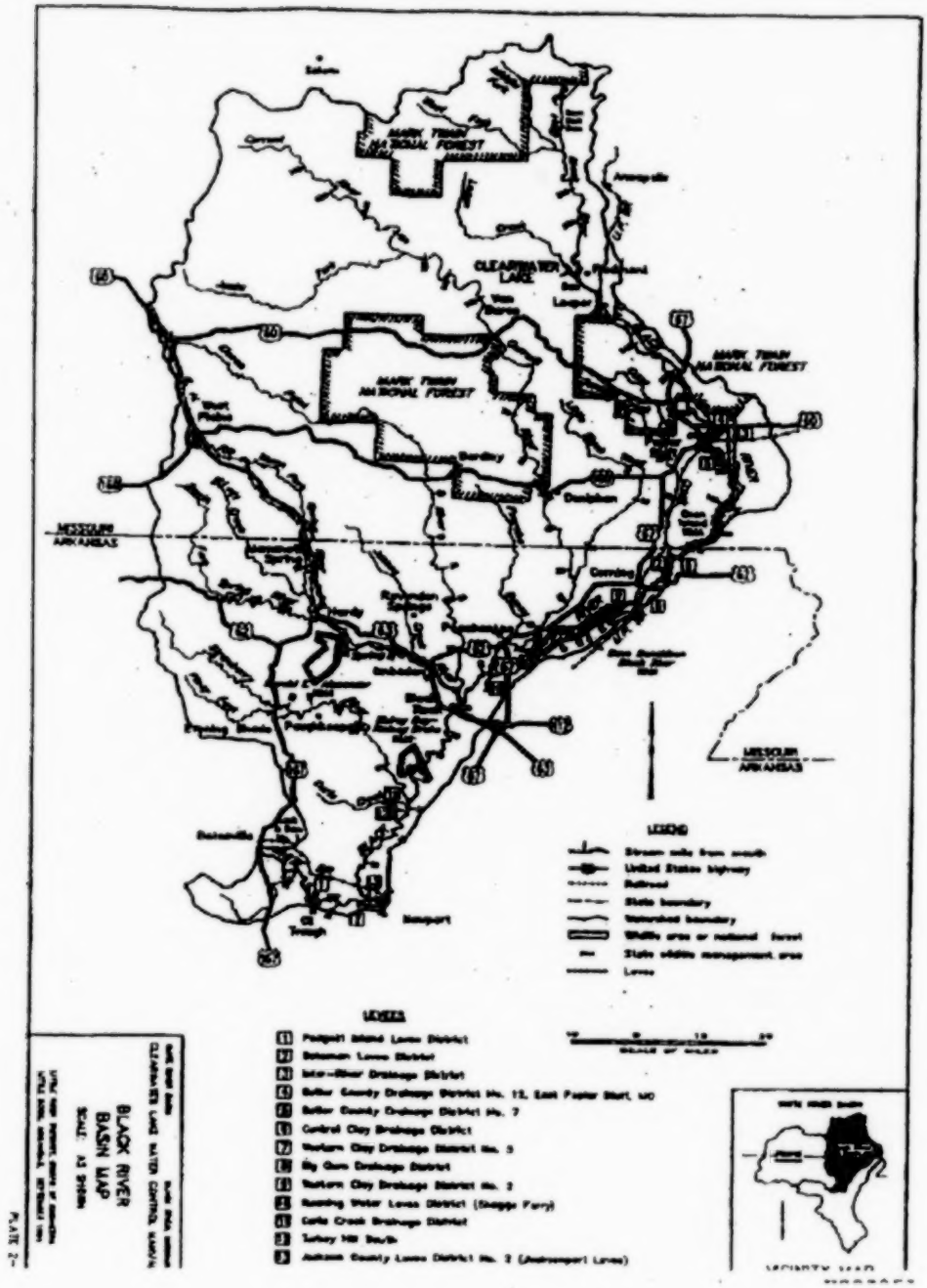
(3) Fishery Drawdowns. The Missouri Department of Conservation is responsible for fishery management. One aspect of such management is lake drawdowns. On other COE lakes, drawdowns are used to concentrate the rough fish population for poisoning and to improve the shoreline habitat by seeding the exposed areas. This also increases the vegetative nutrient level of the lake. No fishery drawdown has been conducted at Clearwater. Boat dock and marina owners in the lake area would be inconvenienced by a drawdown. Before the Division Reservoir Control Center is asked to approve a deviation for a fishery drawdown, the request must be coordinated with the District's Natural Resources Management Branch.

(4) Fish Spawns. Fish spawning generally occurs from the beginning of April to the end of May but may begin in March if it is a warm spring. Often this is the same time that spring runoff is being evacuated from the lake. If the lake level is falling, a request to stabilize the level may be anticipated. If the lake is stable at its conservation pool the request may be to raise the level. The object of both requests is to enhance the success of the spawn and to improve the survival rate of the fry and fingerlings. The stabilization of the falling pool prevents the uncovering of eggs laid in the shallow flooded fringe areas of the reservoir. A raised pool promotes increased survival rates by providing cover and concealment from predators. Generally requests for fish spawn operations on a falling pool must be handled quickly to prevent the uncovering of the eggs. Each request must be evaluated with respect to the available storage and anticipated need for storage during the current hydrologic situation. All requests are handled through the deviation process and, like fishery drawdowns,

must be coordinated through the Natural Resources Management Branch prior to submission to the Division Reservoir Control Center for approval.

7-16. Allowable Rate of Release Change. The maximum rate of release change allowed is 2,000 cfs per hour. Whenever possible, release rate changes of approximately 1,500 cfs per hour are typically used.

* * *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MISSOURI
ARKANSAS
LEGEND
LEVEES
BLACK RIVER
BASIN MAP

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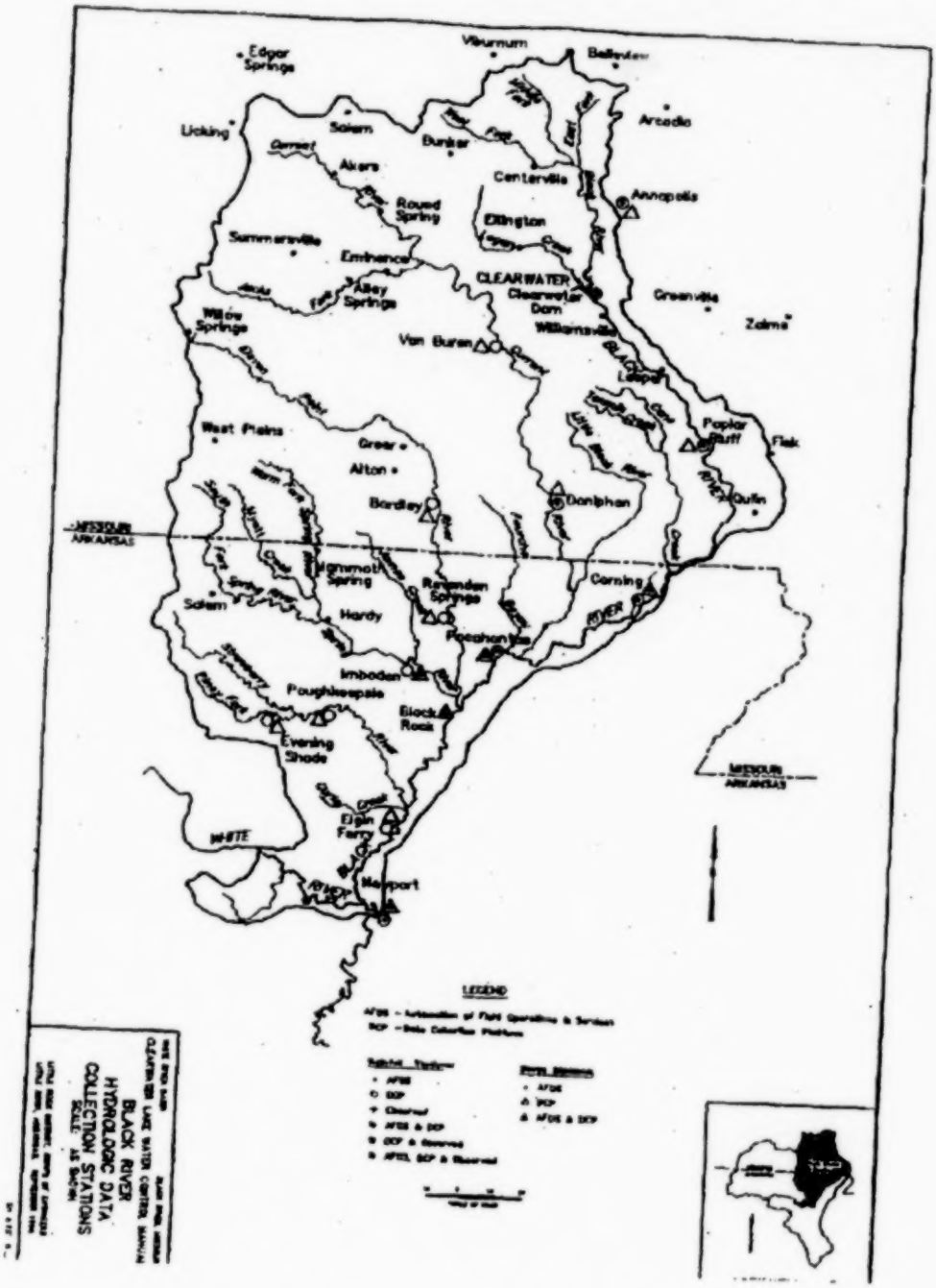
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Bellevue
Licking
Salem
Bunker
Arcadia
Akers
Centerville
Annapolis
Round Spring
Ellington
Summersville
Eminence
CLEARWATER
Clearwater Dam
Greenville
Alley Springs
Willow Springs
Williamsville
Zalma
Van Buren
Leeper
Poplar Bluff
West Plains
Grear
Fisk
Alton
Bardley
Doniphan
Qulin
MISSOURI
ARKANSAS
Mammoth Spring
Corning
Salem
Hardy
Pocahontas
Imboden
Poughkeepsie
Block Rock
Evening Shade
Elgin Ferry
WHITE
Newport
LEGEND
BLACK RIVER
HYDROLOGIC DATA
COLLECTION STATIONS

* * *

DEFENDANT'S EXHIBIT 306

Analysis of the Effects of U.S. Army Corps of Engineers Deviations During 1993-2000 on Tree Stress and Mortality at the Arkansas Game and Fish Commission's Dave Donaldson Black River Wildlife Management Area

Sammy L. King, Ph.D

April 11, 2008

Summary of Conclusions and Opinions

1.0 *Introduction*

I was asked by the U.S. Department of Justice in the above referenced matter to evaluate and state my conclusions and professional opinions regarding the effects of deviations from the Clearwater Lake Management Plan on growth, stress, and survival of bottomland hardwood trees on the Arkansas Game and Fish Commission's (AGFC) Dave Donaldson Black River Wildlife Management Area (WMA). My evaluations are based on a site visit, review of Arkansas Game and Fish Commission's reports about forest conditions over several decades, DOJ expert Witness reports, plaintiff's expert reports, published research studies, and my own experience as a wetland ecologist for over 15 years. I also had numerous discussions with Dr. Wade Nutter, an expert witness for the Department of Justice, regarding Dr. Nutter's hydrologic analysis of the area. I conducted a site visit at the WMA on 11 July 2006.

I was the team leader for the US Geological Survey's Southern Forested Wetland Ecosystem Initiative which involved forested wetland research on three sites by a few dozen scientists. I have given numerous invited and contributed presentations on various aspects of bottomland ecosystems and I have published several papers on these findings as well. My experience with greentree reservoirs (GTR) has resulted in several technical assistance opportunities including the development of a guidebook on GTR development and restoration for the US Environmental Protection Agency, retainment as 1 of 2 independent experts to evaluate the suitability of a controversial GTR development in western Tennessee, and numerous phone call consultations by state, federal, and private entities. A complete copy of my resume is presented in Appendix A.

Currently, I am the Unit Leader of the U.S. Geological Survey's Louisiana Cooperative Fish and Wildlife Research Unit at the Louisiana State University AgCenter's School of Renewable Natural Resources in Baton Rouge, Louisiana. I am an Adjunct Associate Professor with full privileges of the graduate faculty at Louisiana State University. I teach graduate courses in wetlands ecology and floodplain ecology. I mentor graduate students and I am responsible for developing studies, securing funding and personnel (including graduate students), and completion and reporting of the studies. I grew up in Watson, Louisiana, received a B.S. in Biology from Nicholls State University, a M.S. in Zoology and Wildlife Science at Auburn University, and a Ph.D. in Wildlife and Fisheries Sciences at Texas A&M University. My dissertation focused on the effects of flooding on plant succession in GTRs. I have worked in a variety of federal and

University positions since graduation; all positions required me to conduct research in wetland systems. Most of my research has focused on forested wetlands although more recently some of my research has included waterbird use of rice fields and other wetlands.

2.0 Objective

The objective of this expert report is to evaluate the existing information on flooding patterns, tree growth, stress, and mortality, beaver presence and abundance, and GTR infrastructure and management. These activities were conducted for the purpose of developing an opinion as to whether the U.S. Army Corps of Engineers' (COE) deviations from the existing water control plan for Clearwater Lake from 1993-2000 resulted in tree stress and mortality on the Dave Donaldson Black River Wildlife Management Area. A further objective is to reach an opinion as to the proportion of this damage that was a result of these deviations versus natural tree stress and mortality that would have occurred had the COE not deviated during the years 1993-2000.

Critical questions in this analysis are: 1) Did the deviations from 1993 to 2000 cause increased flooding, specifically during the growing season, on the Dave Donaldson Black River Wildlife Management Area?; 2) If so, were the trees damaged or killed by the additional flooding?; 3) If so, how much of the damages can be attributed to additional flooding resulting from the deviation of the management plan versus that of GTR management?

Bottomland hardwood trees differ in flood tolerances and their susceptibility to flooding, thus I will provide background information on the effects of flooding on bottomland hardwood trees and their general and species-specific responses to flooding. Most of my attention will be focused on overcup and Nuttall oak as these are the 2 species of primary concern. I will also provide background information on GTR management. After establishing this background I will address questions 1, 2, and 3.

3.0 Background

Terms will be used throughout this report...

Root zone—entire area (width and depth) that roots are growing underneath a plant.

Anaerobic—lack of oxygen.

4.0 Bottomland Hardwoods

Bottomland hardwood (BLH) forests are distributed along rivers and streams throughout the central and southern United States. These wetlands are valuable habitat for wintering waterfowl, breeding and migrant songbirds as well as other species of wildlife. In addition, BLH forests improve water quality, attenuate flood peaks, and provide a valuable source of timber. Many habitats are available in these systems because the undulating topography common in riverine systems and variable precipitation cycles create diverse surface hydrology where timing, depth, and duration of flooding are dynamic within and among years. This variation in hydrologic conditions controls plant species composition.

The timing, depth, duration, and frequency of flooding and/or anaerobic conditions in the root zone, and light availability are the primary determinants of plant species composition in BLH. Flooded or saturated soils are anaerobic thus affecting the uptake of water and nutrients by root systems of trees. Floodwaters also bring in essential nutrients and water for metabolic processes, thus intermittent and variable flooding often increases BLH tree growth (Broadfoot 1967). However, Kozlowski (2002) noted that prolonged soil anaerobisis is often associated with large declines in production of biomass increment (Kozlowski 2000), death and decay of roots (Blaker and McDonald 1981, Coutts 1982), and tree mortality (Ericson 1989, Kozlowski and Pallardy 1997) in riparian systems, including bottomland hardwoods.

The actual effects of flooding depend upon the species and age of trees, depth, duration, timing, and frequency of flooding, and chemical properties of the soils (Broadfoot and Williston 1973). Growing season flooding is more stressful than dormant season flooding, but there are still many unknowns about the effects of growing season flooding on BLH trees. For example, it is speculated but unproven, that late fall flooding can interrupt carbohydrate storage and may be more detrimental than early growing season flooding (King and Fredrickson 1998). Responses to specific flooding regimes will likely remain speculative, however, as flood histories for a particular tree are cumulative across multiple years. Thus, high rates of tree mortality may actually occur during years of moderate flooding and precipitation because extreme flooding in previous years have stressed the trees and reduced its ability to withstand flooding stresses. For example, King (1995) in a field study from 1991-1993

in East Texas reported that temporal patterns of overstory mortality within a GTR suggested that mortality was either a result of cumulative flooding events over a series of years or a delayed response to prolonged growing season flooding in 1990-1991. In addition, species-specific peaks of overstory mortality were related to the flood tolerance of a given species. This was evidenced by the fact that no mortality occurred during 1991, which was the wettest year on record. Willow oak, which is less water tolerant than overcup and Nuttall oak, peaked in mortality in 1992. Overcup oak mortality did not peak until 1993, which was the least flooded of the 3 year period. Extreme flood years, followed by drought, can be particularly lethal to BLH trees because roots decay under the anaerobic conditions and root/shoot ratios are reduced making the trees less efficient in uptake of water and nutrients (Kozlowski 1984a, 1984b, 1984c, 1997).

Tree size can affect flood tolerance, although the direction of this effect is contradictory (Ernst and Brooks 2003). Several studies indicate that large trees are more flood tolerant than smaller trees (Harms et al. 1980, Kozlowski 1982, Lugo and Brown 1984), whereas other studies indicate that smaller trees are more flood tolerant (King 1995, Young et al. 1995).

Numerous studies have documented the responses of BLH tree species to long-term permanent or semi-permanent flooding (Green 1947, Yeager 1949, Harms et al. 1980). Teskey and Hinckley (1977) reviewed existing literature and classified overcup oak (*Q. lyrata*) and Nuttall oak (*Q. texana*; formerly *Q. nuttalli*) as tolerant, where "tolerant" is defined as: "Trees which can withstand flooding for most of one growing season. Some new root development may be

expected during this period." Hook (1984) reviewed existing studies, including Teskey and Hinkley (1977) and concluded that overcup oak was "highly flood tolerant" and that Nuttall oak was "moderately tolerant". He noted that Nuttall oak is most abundant at sites flooded 10-21% of time and mature trees died after 3 years of continuous flooding.

Studies of overcup oak have confirmed it is the most water-tolerant oak in the United States. Hall and Smith (1955) found that overcup oak remained healthy if flooded for up to 41% of the growing season. Overcup oak growing in impoundments that were flooded from February until 1 July for 4 consecutive years increased radial growth by 20% (Broadfoot 1967); (it should be noted, however, that these findings were based on only 7 trees). In the same study, Nuttall oak, which is less water tolerant than overcup oak but capable of more rapid growth, increased growth by 38%.

Flooding, including flooding from GTR management, influences all stages of forest succession including tree mortality, seed dispersal, seedling establishment, and tree growth. Average annual mortality rates in BLH trees are 2-6% (Johnson and Bell 1976, Harms et al. 1980), however, mortality rates in any given stand are a function of species and age of trees in the stand, biotic factors (e.g., presences and abundance of beaver, diseases), and abiotic factors (e.g., flooding patterns, soil types, wind speeds, ice storms). As trees approach their species-specific maximum age, the probability of mortality increases. High wind speeds, such as those accompanying summer thunderstorms, particularly with saturated soils, can result in windthrow or snapping of trees. Oaks, including Nuttall and overcup oak, are shallowly rooted with large crowns and are

particularly susceptible to windthrow (King and Antrobus 2001). Nuttall oak trees are generally believed to have increased mortality probability at 80-120 years, whereas overcup oak can often exceed 180-200 years without substantial mortality (albeit less is known about overcup oak presumably because it is a low value timber species).

Greentree Reservoir Management

GTRs are stands of BLH that are usually encircled with levees. Water control structures are established at strategic points, and the reservoirs are flooded during winter to provide food for wintering waterfowl and hunting opportunities. GTRs were first constructed in the 1930's and now exist throughout the southeastern United States and as far north as New York. In theory, GTR management is not detrimental to the stand because the trees are flooded only after leaf off (originally thought to represent dormancy) and floodwaters are removed before spring growth is initiated. Early studies indicate that GTR management increased tree growth and that mast production was unaffected (Merz and Brakhage 1964, Broadfoot 1967, Francis 1983). However, a survey of GTR managers in the late 1980's indicated that overstory mortality and a lack of regeneration were common in GTRs (Wigley and Filer 1989). The survey also indicated that windthrow was common. In older GTRs (flooded >20 years as a GTR), 68% of 189 GTRs had problems with tree mortality, 49% experienced problems with crown dieback, and 52% experienced problems with windthrow. These rates were 2 or more times greater than those that had been managed as GTRs for < 20 years.

Some of the above issues have been quantified in more recent studies, two of which occurred in the southern United States. King (1995) studied an east Texas GTR in 1991-1994; the GTR was first flooded in 1989-1990. Record rainfall in 1990 and 1991 and GTR management led to annual mortality rates of 9.9% for willow oak (a species slightly less water tolerant than Nuttall oak) in 1992; no mortality was observed in 1991. Dominant trees were more susceptible to flood induced mortality as evidenced by annual mortality rates increasing to 15.5% when suppressed trees were removed from the analysis. No tree age data were available.

King et al. (1998) studied tree stress and mortality at various elevations at Felsenthal National Wildlife Refuge in southern Arkansas. The Felsenthal GTR is unique, in that it is the largest known GTR, and it is flooded by raising river levels at a lock and dam, rather than through smaller water control structures situated on the floodplain. The Felsenthal GTR experienced extensive, natural, growing season flooding from 1989-1991. From 1990-1995, 18.9% and 10.5% of Nuttall oak stems at mid- and high-elevation sites, respectively, were killed as a result of flood stress. Mortality was also greater in dominant and co-dominant trees. The effects of GTR management, lock and dam management, and natural flooding could not be separated, but GTR management was believed to have amplified the effects of flood stress.

Findings

Pre-existing Conditions

GTR Management

As noted above, and in Kingwood's 2005 report (AGFC 05876-05877) and Dr. Mickey Heitmeyer's report (pp. 35-43), AGFC's design and management of the GTRs at the WMA over the last several decades created problems related to the perpetuation of red oak forests on the WMA. Normal flooding patterns for these systems are highly dynamic both within and among years (AGFC 05876) and the most successful GTR management plans are those that most closely emulate natural variability within a given system (King and Fredrickson 1998). The fact that the impoundments were consistently flooded at about the same time every year is unnatural and is not recommended for GTR management (AGFC 05876; King and Fredrickson 1998). King and Fredrickson (1998) noted that increased tree mortality and decreased regeneration of desirable red oaks will occur if GTRs are flooded to full pool on an annual basis for a specific period of time during the year. Heitmeyer (p. 36; #11) agreed that consistent timing of flooding and drainage of the GTRs since the 1960s has contributed to BLH damage. He further recommended (p.36; #1 under recommendations) implementation of a flooding and drainage regime that more closely emulated natural flooding patterns in these systems. I concur that a more natural flooding and drainage regime would reduce tree stress and increase tree survival in the GTRs.

A second problem created by AGFC's design and management of the GTRs at the WMA relates to the

timing of flooding. Heitmeyer (p. 38; #3) noted that "Early flooding inundates BLH species that are less water tolerant such as Nuttall and willow oak before they become dormant and causes damage such as basal swelling, leaf chlorosis, and tip dieback (Heitmeyer et al. 2004)." As noted above, little quantitative data exists on the relationship between timing of fall flooding in GTRs and carbohydrate storage, but King and Fredrickson (1998) recommended flooding no sooner than 15 November. They noted that many BLH experts believe that root activity may not cease for several weeks after trees lose their leaves and earlier flooding can potentially interrupt carbohydrate storage, thus affecting long-term tree productivity and survival. Admittedly, there is nothing "magic" about this date, other than I believe it is less likely to cause tree stress than an earlier October date.

The lack of independent water level control further exacerbates drainage and management problems (AGFC 5876; Heitmeyer p. 36, #12). Under the AGFC's management regime in place from 1993-2000 (I believe some changes were made based on recommendations of the Heitmeyer report), Reyno and Little River GTRs had to be flooded to flood the Winchester GTR. Therefore, to flood the Winchester GTR in time for waterfowl season, flooding had to begin earlier than necessary in Reyno and Little River GTRs, thereby increasing the probability of tree stress in these areas.

Drainage problems were a major issue during the relevant time period. Drainage problems were influenced by natural drainage patterns on the site, beaver, plugs, and inadequate water control structures. The natural topography of the site includes

numerous interconnected ridge and swale complexes (Heitmeyer p.35; #1 and #3). As a result, blockage in a swale can affect large areas because of the interconnection of the swales. Beaver were abundant on the site (see below) and blockages of the swales by beaver dams were common. Furthermore, inadequate drainage structures or placement of these structures were common (Heitmeyer p. 41-43; Table 9) and prolonged flooding in certain areas.

Heitmeyer p. 39 provided an excellent figure depicting the site locations of specified problems. Although the presence and extent of BLH damage resulting from these damages are not delineated, this type of spatial information is needed (and was unfortunately absent) to fully evaluate the effects of the deviations. The specific types of spatial information that would have benefited this study are addressed in the section below entitled "Kingwood Sampling Design (growth and mortality estimates too)."

Pre-Existing Stand Conditions

Kingwood 2001 (AGFC 001493-AGFC001635), Kingwood 2005 (AGFC 05864-05888), and Heitmeyer implicitly assume that pre-deviation mortality rates, stress levels, and overall condition of the 6 tracts of interest (Table 1) were within normal ranges for healthy bottomland hardwoods. In fact, AGFC 1503 noted that 2001 conditions, specifically mortality, vigor, and ground cover, in Tract 6, control stand 2, were indicative of healthy bottomland hardwood conditions and these conditions were present in GTR stands prior to growing season flooding in 1993-2000. My analysis of numerous documents indicates that degradation of these stands, at least certain areas of

the stands, was common prior to the 1993-2000 deviations. Drainage and stand competition were frequently cited concerns. I summarize my findings below; I use the same names as Kingwood 2001 (AGFC 001493-AGFC001635) to delineate stands. I was unable to find any relevant findings for the 2 control tracts (I assumed the water stressed trees for Compartment 4 were included in the GTR stands; thus they are discussed under Tract 3) but all other tracts are discussed below.

Tract 1; Little River Island GTR—In a 1984 survey (AGFC 2867), Hausman and Zachary noted a net decrease in volume in this unit and classified the stands as "high risk", although no reason was given. In a 1988 survey (AGFC 3257), Hausman noted: "There are significant signs of water stress in the greentree area (stands 2, 3, and 4)...The rapid mortality rate in the greentree area will probably result in a more water tolerant species composition...It does, however, highlight problems associated with poor drainage especially in greentree reservoir land class areas." Heitmeyer p. 41-42 (Table 9)also recognized drainage problems in this impoundment as he listed a total of 15 items to improve drainage in this GTR including replacing pipes and establishing them at lower elevations, clean out drainages, and remove earthen dams.

In a 2001 survey, Gerald Click (PL2767) indicated that the overall compartment was in need of thinning and that the dead trees could have been due to either competition or prolonged growing season flooding.

Tract 2; Reyno GTR—Stands 2 and 3 in this compartment had previously been cited for poor

drainage, including problems associated with beaver. In March 1990 (AGFC 003211) it was noted that "Stand 3 has been heavily influenced by the problem of poor drainage". Bruce Ray (PL 001714; March 1990) added that "Not much timber management work to be done here until the beavers are gone and the water drainage problems are solved." He went on to say "This whole area appears to have been neglected for years." Stand 2 also had drainage problems in 1990 before the 1993-2000 deviations. Ray wrote (PL 001714) that "the most pressing problem for this stand today is beaver control and better water drainage." (Note: To the best of my knowledge, beaver control did not start until after 2000). Heitmeyer also recommended 9 items to improve drainage in this impoundment including removing earthen plugs, removing levees, and clearing debris.

Tract 3; Winchester GTR—Problems with this area were reported as early as 1987. Hausman (AGFC 2987) noted: "A significant percentage of Nuttall oak is showing signs of water stress. The water stress along with other environmental factors has also caused a significant mortality rate of Nuttall oak in this compartment. The mortality rate is 5 trees/acre dead in the last 5 years, so on average we are losing about 1 tree per acre per year. The average tree lost contains about 300 board feet, so we are losing about 700,000 board feet per acre per year in this compartment." Bruce Ray (PL000454) had these remarks about Compartment 3, Stand 6 in March 1990: "The area on a whole is in a very poor state. The underbrush including the reproduction of buttonbush is very thick...The area is a mess in its present state not much account for anything. Recommend opening several holds (*sic*) in the levee around the area in order to let

the water drain. Draining the area would be the proper procedure for timber management." He observed similar problems in Compartment 3, Stand 7 (PL000455): "Need to greatly improve water drainage." About Compartment 3, stand 8 he stated "The Nuttall-Overcup-Ash portion of this stand suffers from the same problems as stand 7. That is poor timber quality, poor access, and poor water drainage. The overcup-ash-cypress area is a little better but not much." Heitmeyer (Table 9, pp. 42-43) listed 11 items to improve drainage and water level control including removing earthen plugs and an "extremely restrictive" drainage structure at Crane Roost.

Tract 4; Gar Slough (see Figures 2.03, 2.04, 2.05, and 5.01 in Burak Expert Witness Report)— In 1991, AGFC noted (PL 001303) several problems based on an October 1991 timber cruise. AGFC noted that the 370 acres in Area 1 "was the only portion of the compartment that does not have flooding problems", although there were past signs of girdling activity from beavers. Area 2 was "very wet", becoming "slightly drier as one moved to the east". The author stated "The entire area is inundated with small beaver ponds and sloughs. A beaver control program should be initiated starting on the west side and working east." Notes (PL 1301-1302) from the 1991 timber cruise also indicate numerous areas that are wet or burned. In 1992 (AGFC 002724), AGFC noted that "a plug placed at the mouth of Gar Slough has inhibited drainage, with the result being possible decline and mortality of mast-bearing tree species in Stand 1. Stand 2 consists of slightly lower elevations, and has fewer mast bearing trees per acre than stands 1 or 3." Finally, AGFC 2515 (unknown date and author) noted that "Beaver problems are a major problem in the dead

timber. Drainage is very limited and beavers have dammed most." AGFC 2515 also noted, however, that "the Nuttall type is in fair shape and little to no water stress is indicated."

Tract 5; Shaver's Eddy—In 1991 (AGFC 003102) this stand had a majority of mature timber with a "thick canopy". It was not recorded, however, whether or not competition could be a factor in the future. In 1999 (PL006012), Steve Mathews reported beaver damage in stands 1, 2, 3, 5, and 7. He stated "There is also mortality due to standing water in these stands. The standing water seems to be due to a beaver dam north and west of the northeast corner of the compartment. This compartment has good timber on it, but the overflow problem on the north needs attention soon." Importantly, it should be noted that there were no extra flood days during the growing season due to deviations in 1999. AGFC 003083 commented in 1999, however, that high summer water resulting from management of Clearwater Lake levels had resulted in a decline in the health and vigor of the timber in this compartment. They noted that "there has been a significant rise of disease and mortality of all hard mast bearing trees within this compartment", but then, they listed aggressive beaver control and improving drainage as two of their general management objectives.

COE Water Management

Nutter summarizes the COE water management practices in his expert witness report. In numerous documents, including the Kingwood Reports (AGFC 001493-AGFC001635 and AGFC 05864-05888) and Heitmeyer's Report it is stated that prolonged growing

season flooding as a result of the COE's deviations created extensive growing season flooding resulting in stress and mortality of the trees. Unfortunately, both parties lack elevation data about the WMA and lack data necessary to quantify the relationship between stage levels at Corning and flood levels in the WMA. Assumptions about these relationships vary throughout various documents (see Nutter report for details) and none are founded on actual data. Nutter attempted to quantify the relationships between the Corning gage and flood levels at selected points in the WMA, but the water level recorders were not able to be deployed until after the GTRs were flooded. Thus, we were not able to determine the effects of a given stage at Corning on flood levels in the GTR. This is unfortunate because it prevents us from determining the actual duration of flooding resulting from various stage levels at Corning.

If we assume that a 5.5 ft stage at Corning induces flooding at the WMA (see Nutter report for inconsistencies in the reported stage necessary to flood the WMA), Nutter's analysis indicates that deviations resulted in more flooding during the summer months than would have occurred without those deviations.

Table 2 is a summary of the number of days the Corning gage achieved heights of 5.5, 6.0, 6.5, 7.0, 7 .5, and 8.0 ft during deviations when the values predicted by the COE's modeling program, the SUPER model, were below those respective stages. The dates of the deviation were identified from a combination of Nutter's graphs and by looking at the raw data files. I imported the observed and expected values for all dates in the deviation period into SAS and summed the number of days that fell within each category. The

raw data for the Corning gage are provided by Nutter and the program (excluding the data; I copied the data from the Excel spreadsheet and pasted it following the "cards" statement in the program) are in Appendix 1.

The results presented in Table 1 indicate that deviations were not responsible for any stages above 5.5 ft in 1999 or 2000. In all other years, however, deviations resulted in up to 59 days of a Corning stage above 5.5 ft on the WMA when the SUPER model predicted stages < 5.5 ft. Excluding 1993 when stages exceeded 5.5 ft as a result of deviations in October after some of the GTR flooding was initiated, the number of extra days reaching a given stage from 1994-1998 were: 1) 5.5 ft – 126 days; 2) 6.0 ft – 125 days; 3) 6.5 ft – 128 days; 4) 7.0 ft – 112 days; 5) 7.5 ft – 99 days; and 6) 8.0 ft – 95 days. Most of these deviations were during June and July and if flooding was indeed a result of the deviation, the slow drainage and minimal water movement created by the GTR infrastructure would create hot, stagnant conditions that would result in low dissolved oxygen (AGFC 001505). These conditions tend to be more stressful on trees than floodwaters that are cooler and flowing. (Hook et al. 1970; Shanklin and Kozlowski 1985). It is also important to note, that these are only the extra days of flooding created by the deviations. Additional natural flooding, as well as intentional flooding from GTR management, also occurred on the sites (see Nutter report).

These stage data do not, however, indicate that bottomland hardwoods on the site were flooded for the same number of extra days that the stage exceeded a given stage (e.g., 59 days of deviations does not mean it resulted in 59 extra days of flooding); the amount of

time flooded at a given elevation could be more or less depending on the timing, duration, and magnitude of increased and decreased stages. Unfortunately, we lack sufficient data to fully interpret the effects of deviations on the extent and duration of flooding on the site given a specific stage level at Corning. Furthermore, we do not know how rapidly the site would drain given specific stage levels. Thus, reconstructing a complete flood history or accurately understanding the extent and magnitude of flooding resulting from the deviations during 1993-1998 is not possible.

It is possible that stages during the deviations produced little additional flooding at least at certain elevations. For example, in 1994, there were 29 days in which stages exceeded 5.5 ft when the predicted value was less than 5.5 ft. However, the SUPER model indicates that the actual difference in the number of days stage levels exceeded 5.5 ft during the deviations was substantially less than at first appears. If we assume that either a 3.5 or 4 ft level is necessary to drain the WMA (see Nutter report of details), then drainage without deviations would not have begun until 6/17/2004 when a $\leq$ 4 ft stage was expected through 6/25 (9 days). However, SUPER model predicted stages $\geq$ 5.5 ft were then achieved on 6/26 and maintained through 7/11/2004. A $\leq$ 4 ft stage was not achieved again until 7/24/08. Thus, unless the area could completely drain in < 9 days, even under non-deviation conditions some areas of the site would not have drained until August. It is also important to note, however, that some drainage would likely have occurred at any stage $\leq$ 5.5 ft (assuming this is the critical stage for flooding of lowest BLH on the site), thus the entire site would not have been flooded.

Although the above analysis would suggest that the effects of the deviations in 1994 were less significant than Table 2 indicates, this is likely not the case. Stage levels in 1994 that exceeded 5.5 ft as a result of the deviation were actually less than the number of deviations that exceeded 6.0 to 8.0 ft stages. As a result, areas of the WMA were flooded that would not have been flooded under non-deviated conditions, or would likely have been flooded to a lesser degree. Furthermore, the increased volume of water on the floodplain would take longer to drain once the stage fell below an unknown threshold level. As noted above, the lack of data regarding: 1) stage at which floodwaters enter the WMA; 2) stage at which floodwaters exit the WMA; 3) the extent of bottomland hardwoods flooded at a particular stage; and 4) the time necessary for drainage of a given GTR make it impossible to determine the actual extent and duration of flooding on WMA and the amount of acreage impacted by any given event. Thus, it is reasonable to assume that the magnitude and duration of the deviations increased the probability of tree mortality in some areas as the stage deviations would have flooded areas that may not have been flooded otherwise and increased drainage time of the GTRs because of increased volumes of water. However, there is no realistic way to quantify these effects or determine how pre-existing conditions and GTR management (particularly drainage issues) affected forest response.

Kingwood Sampling Design (growth and mortality estimates too)

It is clear that GTR management, beavers, and the COE deviations all combined to increase the

probability of tree mortality on the WMA. However, the lack of spatial information for the Kingwood plot data, inaccurate mortality calculations (Steve Burak, expert witness report), a lack of elevation data for BLH stands, limited hydrologic information, and post-deviation changes in beaver densities and GTR infrastructure prevent any accurate assessment of the degree of damage that the COE deviations had on the bottomland hardwood resource, assuming there was an increase in tree mortality between 1993-2000.

It is impossible to assess whether or not the Kingwood 2001 Report (AGFC 001493-AGFC001635) is an accurate assessment of conditions on the WMA. I do not doubt that they observed dead trees, but I can not determine from available data whether or not plots were clustered in high mortality areas such as sloughs, low lying areas, or beaver ponds that may have been a pre-existing problem before 1993. Reports of pre-existing conditions (as stated above) for the stands of interest indicate that drainage and/or beaver problems were widespread across large areas of the WMA for several years prior to 1993. I am unaware of the implementation of beaver trapping or drainage improvement efforts to reduce timber stress and mortality in sites identified in pre-deviation reports. Thus, if modifications were not made in these areas to improve drainage, timber degradation and mortality would have been occurring at some unknown, but accelerated, rate prior to 1993.

Mortality was calculated by estimating the mortality rate in sampled plots and extrapolating to the entire WMA. This may not be accurate as the site is very heterogeneous, with lots of ridge and swale topograpy and interconnected wetlands. Furthermore, as noted in

the Kingwood 2005 report (AGFC 05875) mortality was unequally distributed across the site with the greatest concentrations in the low lying areas. Many of these same areas suffered drainage problems prior to the deviations and the lack of spatial locations of cruise plots prevents us from determining 1) how representative the plots are to the remainder of the area, and 2) how much of the mortality may have occurred due to previous drainage problems. Relative to #1, if the proportion of low lying plots is overrepresented in the 2001 cruise surveys relative to the entire site, mortality rates would be higher than actual rates because the low lying areas had higher rates of mortality. The problems relative to # 2 are discussed in detail above in the "Pre-existing Conditions" section.

Erroneous, Unproven, and/or Untestable Assumptions

Before providing my conclusions, I believe it is important to address several other issues and assumptions discussed in the various reports. First, as described in detail above, the lack of elevation data on the WMA and the lack of quantification of the relationship between stage level at the Corning gage and flooding levels in the WMA are problematic in interpretation of results. This prevents us from determining the actual duration and extent of flooding resulting from various stage levels at Corning and hinders the analysis of the effects of deviations on bottomland hardwood tree stress and survival.

Secondly, a reduction in tree growth as a result of the deviations was mentioned in both the Kingwood Reports and Heitmeyer's report. AGFC 05871 noted that radial growth during the 5-year period 1994-1998

averaged only 9.6 mm, while radial growth of these trees during the following five years (1999-2004) averaged 13.1 mm, a 36% increase. Dr. Baker stated on 7/11/06 (King's field notes) that this was based on samples of about 15 trees per site bored about 6 inches deep or so. Dr. Baker does not mention whether or not the trees were crossdated (which is an important step), but in my opinion the sample size is insufficient to make broad judgements on tree growth and flooding relationships. Heitmeyer (pp. 31-34) had a much larger sample size (270 tree cores), the samples were distributed over a range of size classes, and samples included 2 species of trees at various elevations that were subjected to natural and/or managed flooding. Heitmeyer did not use crossdating techniques or standardization techniques as explained by Grissino-Mayer and references therein. Crossdating is a quality control technique that minimizes misclassification of tree ages and growth rates. Standardization techniques are superior to raw growth measurements because as a tree gets larger the width of the annual increment decreases (although volume increases; i.e. the tree diameter is larger so a greater volume is attained with a narrower ring width) regardless of environmental conditions. Thus, as a stand ages and trees get larger, plots of raw values (as in Heitmeyer's report) could erroneously indicate that growth has declined.

Grissino-Mayer based his expert witness report on a total of 862 5-mm diameter increment cores collected by Sizemore & Sizemore, Inc. during summer 2007 (Grissino-Mayer expert witness report; Wayne Williams expert witness report). The cores were taken from Nuttall oaks and overcup oaks growing within seven sites. Two cores were taken from most sampled

oaks, although some cores extended across the entire tree's diameter, providing two dateable radii. Grissino-Mayer concluded that there was either no difference in tree growth during the 1993-2000 period compared to the 1980-1992 period, or it actually increased in the 1993-2000 period (Upper Island and Gar Slough). These results contradict those of Baker and Heitmeyer and I found them to be somewhat surprising considering the length of flooding (natural and induced) during 1993-2000 and the mortality rates reported by Baker. Most trees under stress reduce tree growth prior to mortality (Bigler and Bugmann 2004, Bigler et al. 2004), although none of these studies were conducted in bottomland hardwoods. Unfortunately, I am aware of only one study that has evaluated Nuttall and overcup oak tree growth and mortality and it is not of much assistance. Overcup oak growing in impoundments that were flooded from February until 1 July for 4 consecutive years increased radial growth by 20% (Broadfoot 1967); (it should be noted, however, that these findings were based on only 7 trees). In the same study, Nuttall oak, which is less water tolerant than overcup oak but capable of more rapid growth, increased growth by 38%. Neither species showed indications of decline or mortality at the end of the study.

The inconsistencies in tree growth analyses may be attributable to several factors. First, the Baker analysis is simply based on too small a sample size. Second, error is introduced in the Heitmeyer study because of the lack of crossdating and standardization. Unfortunately, the cores were discarded and we were unable to reanalyze these cores. Third, variability in site and stand conditions and the lack of spatial data regarding the Kingwood and Heitmeyer samples

prevent a replication of the analyses. Thus, once again, the results may be influenced by high inherent variability in site conditions. This last error, however, should have been minimized by the large number of samples collected and analyzed in the Grissino-Mayer study. However, precise elevation data for the site (and hence of the trees analyzed) were not available and it is possible that combining across elevations masked any flooding effects. The fact that overall, trees increased in growth, suggests that if flooding did affect growth, it was minimal and limited to certain areas. It is definitely not "a certainty that a reduction in growth rate for trees that were neither damaged or killed by the prolonged growing season flooding did occur" as stated in AGFC 05886.

Kingwood 2005 report (AGFC 05881) attributed timber damage and windthrow directly to the flooding as a result of the deviations. AGFC 05879 noted that the "Resource Evaluation and Damage Appraisal Report dated January 2001 clearly showed that the cause of elevated mortality and forest decline in the WMA was the result of extended periods of flooding during the spring and summer seasons." In my opinion, however, the extent of the effects of the deviations were overstated and not supported by data. In addition to my concerns about the tree mortality data, it is clear that some of the tree damage experienced in 1993-2000 must be attributed to past GTR management and beaver issues. For instance, AGFC 05881 implied that trees killed by windthrow were a result of the deviations. However, Wigley and Filer (1989) found that 52% of GTRs in their survey experienced problems with windthrow. Based on that study, loss of trees from windthrow is a common problem in GTRs and may not be related to the deviations. Furthermore

AGFC 05881 also noted that many of the trees had heart rot, sap rot, or some other disease problem as a result of prolonged flooding. However, prolonged growing season flooding was recognized by AGFC as a problem prior to the deviations. Thus, it is unknown how many of these trees had a pre-existing condition.

Finally, numerous changes have been implemented (or suggested) on the WMA since the deviations, including an intensive beaver trapping program. AGFC 003770 indicated that AGFC removed 806 beaver from 2001-2004 and Scott Cagle, the beaver trapper, noted (AGFC 003665) in 2003 that "the WMA looks better and dryer than any of us have ever seen it." Extended growing season flooding, such as occurred between 1993-2000 (and to some degree would have occurred without the deviations), can facilitate beaver occupation by maintaining high water levels and replenishing water that is lost due to evapotranspiration. Previous reports also indicate, however, that beaver were a problem as early as the late 1980's. The data provided in AGFC 003770 simply indicates that beavers were abundant on the area and Burak's expert witness report (Figs. 2.03, 2.04, 2.05, and 5.01) illustrate that beaver damage and lodges were widespread. It appears that AGFC did not seriously attempt to control beaver populations until 2001.

Conclusions

1) Pre-existing stand conditions (i.e., prior to the deviation) indicate that drainage and beaver problems has cause, or were causing, tree stress and mortality in many stands. There is not documentation to

indicate that these problems were rectified prior to or during the 1993-2000 time period.

2) GTR design and management practices would have increased the probability of tree stress and mortality in the absence of the deviations. Flooding at the same time each year, flooding too early in the fall, lack of independent water-level control, improper placement of drainage structures, and drainage plugs would directly increase tree stress and mortality.

3) Assuming the relationship between stage levels at Corning and flood initiation on the WMA is correct, the COE deviations resulted in substantial additional flooding. This flooding would have increased the probability of tree stress and mortality in the absence of GTR management. Flooding occurred for extended periods during some of the hottest months which would have increased tree stress because of reduced dissolved oxygen.

4) The lack of spatially explicit cruise plot data prevents an accurate assessment of mortality rates, particularly those that occurred during the 1993-2000 time period. This is problematic for two reasons. First, stand conditions, including stocking rates, stem densities, and species composition, are heterogeneous, partly because of natural variability and partly because of pre-existing problems associated with drainage issues. Thus, we are unable to assess how much of the mortality was a result of pre-existing drainage and beaver issues. Secondly, mortality was purportedly higher in low elevation plots. Thus, if a greater proportion of cruise plots were located in low elevation areas than occur on the WMA as a whole, extrapolation would result in an erroneously high

mortality rate. Thus, the spatial location of the cruise plots is essential to determine the relative accuracy of the mortality estimates.

5) According to Grissino-Mayer's results, tree growth does not appear to have declined during the period of the deviation. Problems associated with sample size and analytical techniques cast doubt on the validity of the Baker and Heitmeyer findings. The more detailed analysis of Grissino-Mayer of a much larger number of tree cores collected in the same Units suggest that tree growth during 1993-2000 was either no different than growth between 1980-1992 or growth actually increased during 1993-2000.

6) Due to pre-existing conditions, GTR management, and a lack of spatially-explicit stand assessment information, it is impossible to determine what proportion of the damage reported by Kingwood 2001 (AGFC 1493-AGFC 1635) is a result of the deviations.

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I, Sammy Lee King, certify to the best of my knowledge and belief that this report, prepared by me or under my supervision, is true and correct. The research presented herein was authorized by the United States Department of Justice, Environment and Natural Resources Division, Natural Resources Section. I received no compensation for this project other than travel expenses. I have also not testified in any other cases during the last 4 years.

/s/ Sammy King **4/11/2008**

Table 1. Comparisons of tracts, as defined in Kingwood Reports, with GTR unit names and compartments as defined in various AGFC reports.

Tract[1]	Name of Unit	Compartments[2]
1	Little River Island GTR	1 and 11
2	Reyno GTR	10
3	Winchester GTR	4 and part of 3
4	Gar Slough	8
5	Shaver's Eddy	7
6	Controls 1 and 2	4 and 5

Table 2. Number of days observed stages exceeded expected stages at Corning during deviation periods (i.e., in 1994 there were 29 days when the supermodel predicted stages below 5.5 ft at Corning but the observed value was > 5.5 ft. Deviations were limited to

1 April to 31 October each year (i.e., winter deviations were deleted).

Year	5.5 ft	6.0 ft	6.5 ft	7.0 ft	7.5 ft	8.0 ft.
1993[1]	14	13	15	16	12	6
1994[2]	29	35	34	37	39	41
1995[3]	6	6	14	22	26	32
1996[4]	18	19	19	18	7	4
1997[5]	14	15	18	24	21	13
1998[6]	59	50	43	11	6	5
1999	0	0	0	0	0	0
2000	0	0	0	0	0	0
Total	***140***	***138***	***143***	***128***	***111***	***101***

[1]The stages for 1993 were for the dates 10/10 to 10/31.

[2]The stages for 1994 were for the dates 06/04 to 07/23.

[3]The stages for 1995 were for the dates 05/29 to 07/19.

[4]The stages for 1996 were for the dates 06/16 to 07/06.

[5]The stages for 1997 were for the dates 06/15 to 07/09.

[6]The stages for 1998 were for the dates 05/20 to 09/25.

* * *

DEFENDANT'S EXHIBIT 308

A RETROSPECTIVE APPRAISAL OF THE BEFORE AND AFTER VALUES OF TIMBER ON THE DAVE DONALDSON BLACK RIVER WILDLIFE MANAGEMENT AREA, ALLEGED TO HAVE BEEN DAMAGED BY UNITED STATES CORPS OF ENGINEERS DEVIATIONS FROM 1993 TO 2000 AS OF JANUARY 1, 2001

Prepared for
U. S. Department of Justice

by
Sizemore & Sizemore, Incorporated
Forest Appraisal, Analysis, and Management
Tallassee, Alabama

April 11, 2008

* * *

WMA TIMBER SALE DATA

The AGFC had 18 timber sales over the period 1987 to 2004 (table 3.03) following map. Sales ranged from 273 MBF to 1,893 MBF for a total of 16,669 MBF sold. Stumpage prices ranged from $66 per MBF to $433 per MBF and averaged $274 per MBF. The sale prices are plotted in figure 3.04, shown in figure 3.05, and more detailed information on each sale is shown in exhibit 3.02.

FIGURE 3.04:
WMA STUMPAGE SALES 1987 TO 2004

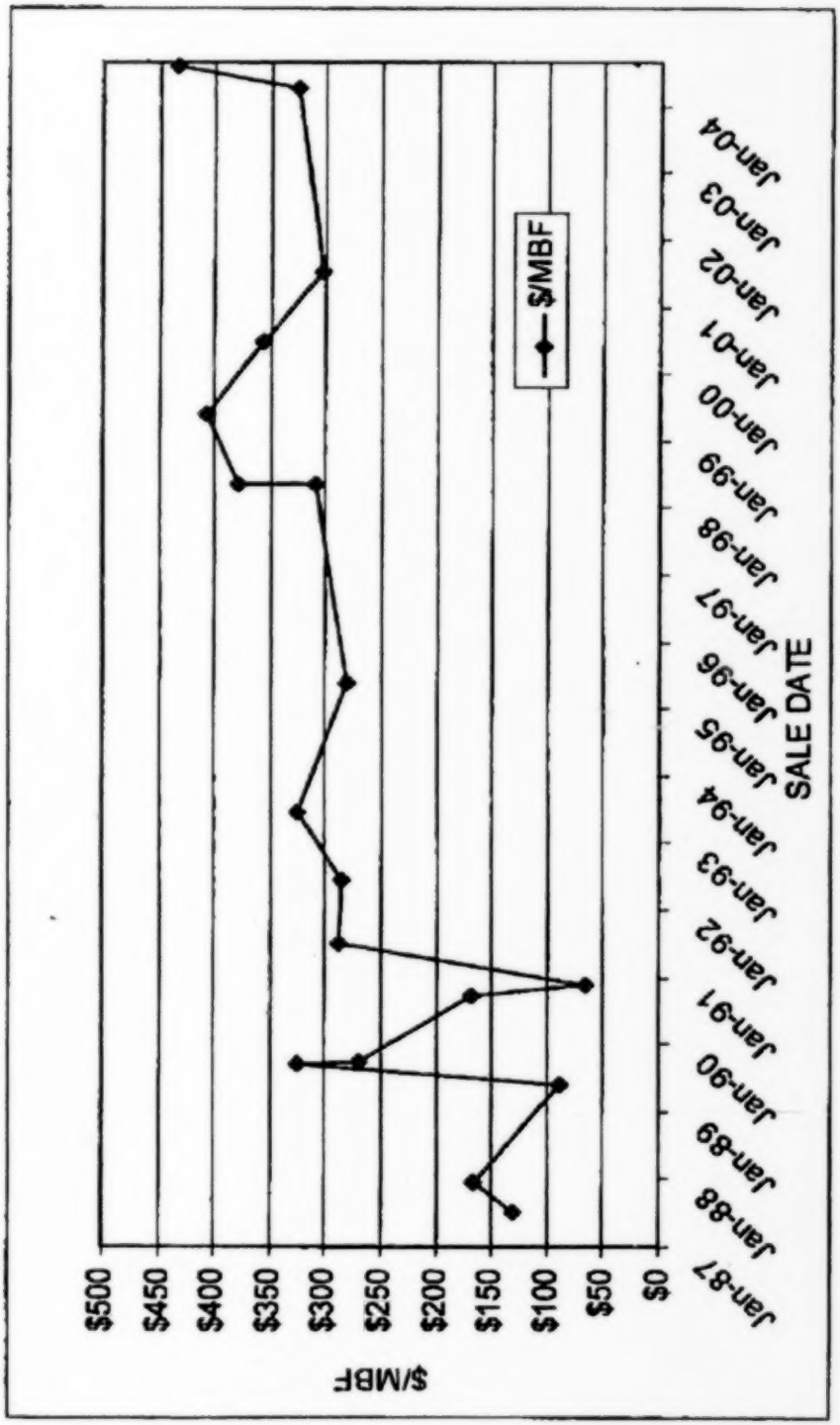

FIGURE 3.05:
WMA TIMBER SALES 1987 TO 2004

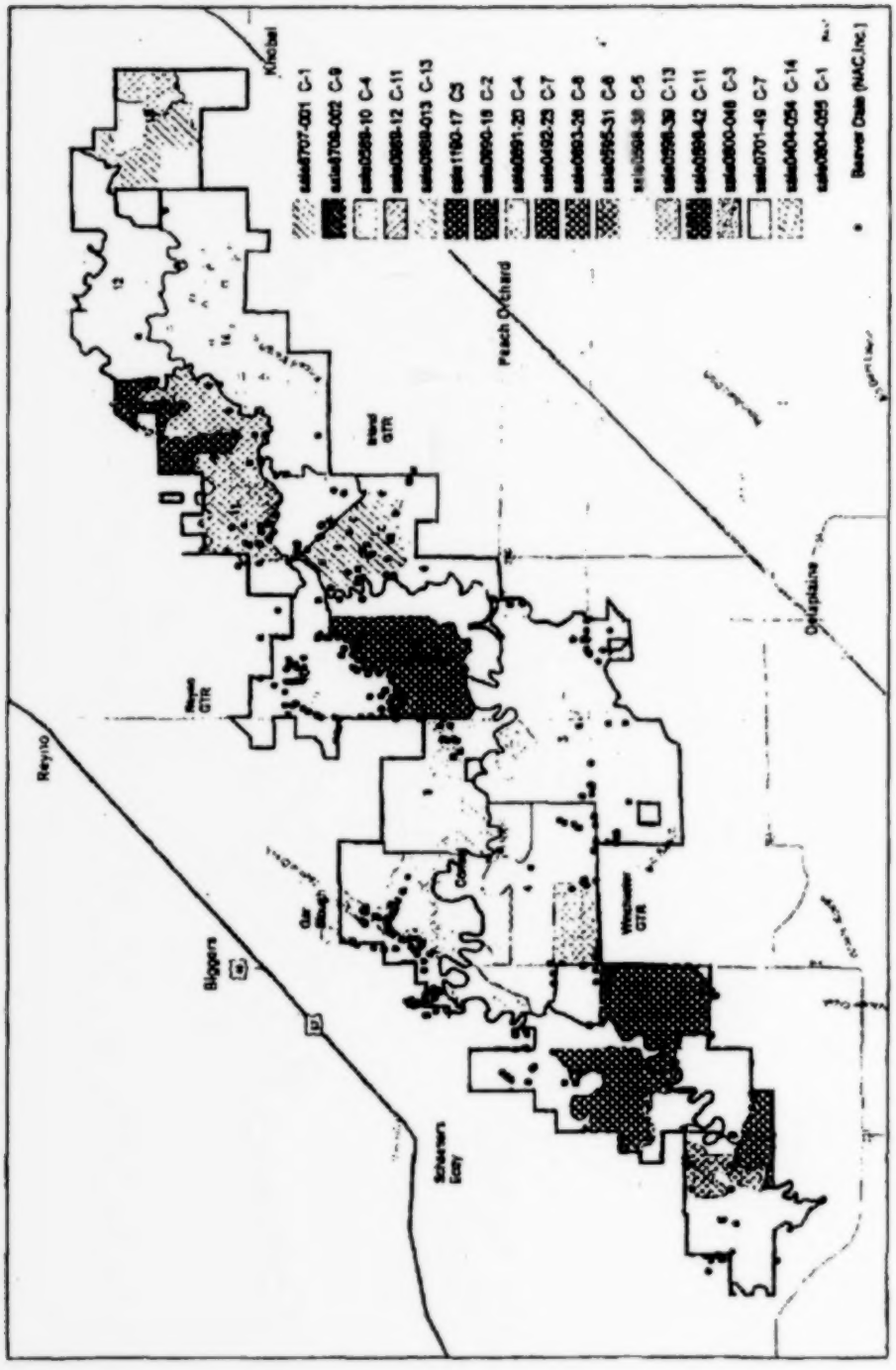

TABLE 3.03:
WMA TIMBER SALES 1987 TO 2004

Bates	Page#	Sale#	Sale Date	Buyer	Sale Price
AGFC	9103	8707-001	6/30/1987	J.H. Hamlen	$114,025
AGFC	9205	8709-002	12/8/1987	Curtner Lbr.	$153,850
AGFC	5371	0589-10	5/30/1989	J H Hamlen	$105,396
AGFC	5455	0989-12	9/19/1989	Moore	$402,555
AGFC	9001	0989-13	9/26/1989	Sweaney's S/M	$120,000
AGFC	5611	0990-18	9/25/1990	J W Black	$168,206
AGFC	5518	1190-17	11/15/1990	B. Sweaney	$75,000
AGFC	5664	0691-20	6/28/1991	Ozark Lbr. Co.	$105,374
AGFC	5715	0492-23	6/15/1992	Curtner Lbr.	$255,995
AGFC	5768	0693-26	6/14/1993	J.W. Black	$331,626
AGFC	5823	0595-31	5/15/1995	J.W. Black	$76,630
AGFC	4949	0598-39	5/6/1998	J.W. Black	$96,100
AGFC	4950	0598-38	5/6/1998	T.&S. Sawmill	$525,745
AGFC	4948	0599-42	5/26/1999	J.W. Black	$379,331
AGFC	8923	0600-46	6/22/2000	J.W. Black	$382,600
AGFC	4946	0701-49	7/18/2001	Moore	$200,000
AGFC	10662	0404-54	4/7/2004	A. Smith Log.	$616,460
AGFC	10654	0804-55	8/11/2004	Moore	$457,460

Acres	Compt	Total MBF	Red Oak	White Oak	Misc HST	$/MBF	HPW
464	1	867.6	401.9	214.0	251.7	$131	0.0
629	9	923.4	464.3	203.9	255.2	$167	0.0
700	4	1,200.0	800.0	300.0	100.0	$88	0.0
1,059	11	1,237.5	712.8	112.9	411.8	$325	0.0
425	13	444.6	273.7	64.0	106.9	$270	0.0
772	2	995.4	666.3	186.5	142.6	$169	0.0
852	5	1,128.4	341.4	515.0	272.0	$66	0.0
292	4	367.1	270.2	39.1	57.6	$287	
629	7	900.2	611.5	151.8	136.9	$284	0.0
568	8	1,016.4	389.2	436.3	190.8	$326	0.0
219	6	273.2	162.7	71.3	39.3	$280	0.0
186	13	309.7	179.1	97.7	33.1	$310	0.0
475	5	1,393.6	825.0	383.7	184.9	$377	0.0
313	11	929.8	626.1	146.4	157.3	$408	0.0
519	3	1,075.1	724.9	146.7	203.5	$356	0.0
210	7	658.3	324.7	67.8	265.8	$304	0.0
516	14	1,892.7	1,011.7	145.7	735.3	$326	0.0
408	1	1,056.3	588.1	300.3	164.6	$433	0.0

Bates	Page#	Sale #	Sale Date	Buyer	Sale Price
					$4,566,353

Red Oaks	Nuttall, Willow, Water, Cherrybark
White Oaks	White, Overcup, Chestnut, Cow, Swamp White
Total MBF/Ac*	Typical harvest target is 30% of stand volume, thus 1.805 MBF/acre divided by 0.30 equals an estimated 6.016 MBF/ac total.

Acres	Compt	Total MBF	Red Oak	White Oak	Misc HST	$/MBF	HPW
9,236		16,669.3	9,373.6	3,583.1	3,709.	$274	
$494			56%	21%	22%		
	Cut MBF/ Ac	1.805					
	Total MBF/ Ac*	6.016					

DEFENDANT'S EXHIBIT 310

EXPERT REPORT

Analysis of Hydrology of the Black River Basin and the Dave Donaldson-Black River Wildlife Management Area

Southeast Missouri to Pocahontas, Arkansas

Wade L. Nutter, Ph.D., P.H.
Nutter & Associates, Inc.
Athens, GA

April 11, 2008

Nutter & Associates
environmental consultants

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1.0 INTRODUCTION

My name is Wade L. Nutter and I reside at 140 Tillman Lane, Athens, Georgia. I retired from the University of Georgia in 1997 with 30 years of service and was honored with the title Professor Emeritus of Soils and Hydrology by the University System of Georgia Board of Regents. I am currently President of Nutter & Associates, Inc, an environmental consulting firm with offices in Athens, Georgia and San Juan, Puerto Rico. Nutter & Associates was started in 1984 as Earth Systems Associates, Ltd. and I have been President since its inception. While at the University I taught undergraduate and graduate courses in hydrology, soils, hydrologic modeling, hillslope hydrology, land application of wastes, and environmental monitoring as well as others related to forestry and hydrology. I also conducted research and directed graduate students in the same topics. I received a Bachelor of Science degree in forest resources and a Master's Degree in forest hydrology from The Pennsylvania State University in 1960 and 1964, respectively, and a Ph.D. in hydrology and soils from Michigan State University in 1968. A copy of my resume is attached as Exhibit A.

I have been responsible for conducting many projects as a consultant related to impacts of land use practices to water quality, rate and volume of runoff, erosion and sedimentation, and wetland hydrology and function. I have taught many short courses in my career to consultants and scientists in each of these subject areas. I was appointed by the Governor of Georgia to serve on the Academic Panel on turbidity standards in streams, the Georgia Hazardous Waste Authority, and the Environmental Education Council and I served on the Georgia Forestry Best Management Practices guidebook task group.

I am considered an expert in hydrology and soils and have been admitted as an expert in Federal District Courts and Georgia Superior Court on numerous occasions. I am a Professional Hydrologist (American Institute of Hydrology) and was a Registered Forester (Georgia) for 35 years through 2007 when I transferred to inactive status.

2.0 REPORT OBJECTIVE

The objective of this expert report is to determine if, through evaluation of existing information and site specific information collected as part of this evaluation, the management of releases from the Clearwater Lake by the U.S. Army Corps of Engineers had impacts on the frequency and/or duration of inundation in the Dave Donaldson-Black River Wildlife Management Area (WMA) during the period 1993 through 2000. As part of my evaluation I visited and toured the WMA on several occasions and installed a series of water level recording devices within the WMA. A secondary objective is to review and evaluate the reports related to hydrology of the

Black River and the WMA prepared by plaintiff's expert.

3.0 BACKGROUND

The Black River watershed that is the subject of this report begins in southeastern Missouri and flows to the Clearwater Lake and dam, through the town of Poplar Bluff, MO, across the Arkansas border to Corning, AR and Pocahontas, AR. Just upstream of Pocahontas and straddling both sides of the River is the approximately 23,000-acre Dave Donaldson-Black River Wildlife Management Area. The WMA is administered by the Arkansas Game & Fish Commission as a wildlife and hunting preserve. One of the principal game species is migratory waterfowl that pass through the area in late fall and early winter. Parts of the WMA are managed as a Greentree Reservoir (GTR) which entails a series of levees and water control structures such as dams with stop logs, culverts with valves, and siphons to maintain a flooded forest condition for enhancement of waterfowl habitat. There are additional areas outside the GTRs which are subject to flooding as the river stage naturally rises and falls without artificial control structures.

The total watershed area upstream of the WMA, including the WMA, is 1,897 square miles (mi^2) or 1,214,058 acres. The watershed area above Clearwater Dam is 898 mi^2. The river gaging station at Poplar Bluff is used as a control point for releases from Clearwater Lake. The total watershed area above Poplar Bluff 1,245 mi^2. Thus there is 347 mi^2 of watershed area between Clearwater Lake and Poplar Bluff that is not regulated by dams or other control structures. This intervening unregulated area is 28%

of the total watershed area contributing flow to the Black River at Poplar Bluff. Starting from the mouth of the Black River the Clearwater Dam is at river mile 257.4 and the Poplar Bluff gage at mile 211.2.

The next stream gaging station downstream from Poplar Bluff is at Corning, Arkansas at river mile 152.2. The drainage area above the Corning gage is 1,749 mi^2 (851 mi^2) with an intervening unregulated drainage area of about 49% of the area contributing flow to the Black River at Corning.

The Dave Donaldson-Black River Wildlife Management Area begins at about river mile 142 and extends to river mile 100. The tributary streams that enter the Black River between the Clearwater Dam and the WMA are all unregulated, i.e., there are no dams or other major control structures used to manage the River discharge. The Current River, a major tributary to the Black River, joins the Black River at river mile 96.2.

Figure 1 is a general location map of the Black River basin from the headwaters to the Dave Donaldson-Black River Wildlife Management Area showing Clearwater Lake, the locations of the Poplar Bluff and Corning river gaging stations, and the WMA.

4.0 CLEARWATER LAKE OPERATION-THE WATER CONTROL PLAN

The Clearwater Lake and Dam is managed by the U.S. Army Corps of Engineers, Little Rock District, in accordance with a regulating plan (Water Control Manual, Clearwater Dam and Reservoir, Black River Basin, Missouri and Arkansas, USACOE Little Rock

District, February 1953, Revised July 1995). The initial regulating plan from 1948 to 1950 specified that the River at Poplar Bluff be regulated to a stage of 12 feet (4,000 cfs) during the agricultural season (April through November) and 14 feet (5,000 cfs) during the non-agricultural season (December through March).

In 1950 the regulating plan (the Water Control Manual) was changed to the following for the Poplar Bluff stage:

1. Regulated stage of 10.5 feet (approximately 3,500 cfs) during the agricultural season (1 April through 30 November); and
2. Regulated stage of 11.5 feet (approximately 4,000 cfs) during the non-agricultural season (1 December through 31 March).

However, pool elevations in the lake were also considered in regulating discharge so certain goals such as recreation and flood protection could be met. The following is a summary of some of the lake elevation management goals.

- Conservation pool elevation is 494.0 feet.
- Pool raised to 498.0 feet on 1 May, actual timing depends on fish spawning, and maintained through May.
- On 1 June, the beginning of mosquito season, pool is drawn down to 496.5 feet by 15 September. Pool then drawn to 494.0 by 8 October. After 8 October pool is held constant until May as required for flood control.
- Flood control pool elevation is 567.0 feet.

Serious flooding in the Black River Basin can result from short intense storms over concentrated portions of the basin and from extended periods of heavy rainfall over major portions of the basin. Flooding can occur at any time of the year; most serious floods occur in the spring. From 1952 through 1994 an average of about two major rainfall events occurred per year leading to major flooding at the Clearwater Dam, with the rainfall events lasting from 2 to 9 days and amounts ranging from 3.05 inches in 5 days to 10.74 inches in 6 days.

Clearwater Lake is regulated to reduce flooding on the Black River. Releases during floods are scheduled so that the combined flow from unregulated areas (between the dam and Poplar Bluff) and the Lake are maintained at the planned operating stages at Poplar Bluff as specified in the Water Control Plan. An average travel time of 48 hours from the dam to Poplar Bluff is used with expected flows from the intervening area between the dam and Poplar Bluff to predict the controlling stage at Poplar Bluff and thus, the discharge released from the dam.

Durations and frequencies of discharges from Clearwater Lake and potential flows from the intervening area at the downstream Poplar Bluff and Corning locations are determined by use of the SUPER model. The SUPER model (Southwestern Division Reservoir Regulation Simulation Computer Model) was developed by the Corps of Engineers for managing reservoir releases and predicting downstream flows (a description of the SUPER model is presented in Appendix A). SUPER is not a predictive model but rather uses current information to show what does

happen, or what would have happened given a series of past events.

The following is a summary of procedures for forecasting Lake inflows, releases, and stage at Poplar Bluff (US00811-US00815).

- Expected runoff into the Lake is based on rainfall forecast and automated raingage network.
- A 4-day Lake pool level forecast is made each "workday"; pool forecasts also used to determine flood control releases (i.e., releases in addition to normal pool level maintenance).
- Streamflow forecasts to estimate stage at Poplar Bluff are conducted for short-term daily and long-term based on pool release forecasts and unregulated flow forecast (flow from basin area between Dam and Poplar Bluff). Long-term forecasts are calculated for Lake release flow and unregulated area flow for use in pool emptying (i.e., pool level maintenance) forecasts.
- Flood condition forecasts are conducted whenever there is runoff producing rainfall on the basin and forecasts of flows and stages in the Lake and the downstream regulating gage at Poplar Bluff. Following each rise in pool level as a result of rainfall produced runoff, a release schedule is developed for the Lake based on the recession hydrograph at Poplar Bluff (i.e., the rate at which river stage declines). Using the release schedule and estimated recession flows at Poplar Bluff, Clearwater Lake pool elevations are forecast for the flood water evacuation operation.

A White River Ad Hoc Work Group, whose membership consists of representatives from the local agricultural community, the Arkansas Soil and Water Conservation Commission, the Arkansas Game & Fish Commission, the Missouri Department of Conservation, and other interested parties provide feedback to the Corps of Engineers on releases from the Dam and controlling river stages. This Work Group, as well as any affected party (such as farmers, local communities, the Game & Fish Commission, Clearwater Lake Association, and many others) may request from the Corps a deviation in operation as specified by the Water Control Plan. The Corps may also implement a deviation from the Plan for Lake facility and dam maintenance. Deviation requests have ranged from increasing weekend releases for a summer river festival; reducing releases to alleviate flooding of agricultural fields; controlling flows to allow the GTRs in the WMA to drain; repair of WMA levees and structures; repair of gaging stations and the Dam; and other matters that require a deviation from the established Plan. The Corps typically considers the request and predicts how the deviation request will affect future releases and how much additional time will be required to meet the lake pool elevations specified in the Plan for the particular time of the year the deviation is requested.

4.1 Deviations to the Water Control Plan

In September 1993, the Corps' Little Rock District formed an ad hoc group of various interest groups to perform their own investigations of the Water Control Plan and to make recommendations for changes within the project authorizations (US004059). A separate sub-committee was formed in February 1996 to address

issues related specifically to the Clearwater Lake and Black River basin.

However, during the 1990s several requests were submitted by the Ad Hoc Work Group to the Corps requesting a long term, on at least an annual basis, deviation from the Water Control Plan. These longer term plans were in addition to short term requests that the Corps received almost annually.

A list of the implemented deviations obtained from Corps records for the period from 1993 through 2000 is presented in Table 1.

4.1.1 1993 Deviations

On 29 September 1993, the Corps designated a regulated deviation stage at Poplar Bluff of 6.0 feet and requested approval for a continuation of the deviation operating stage of 6.0 feet through the crop harvest (fall) season. The Corps memo (US004002) further states that although the normal regulating stage for April through November is 10.5 feet (as specified in the Water Control Plan), maintaining the deviation stage to 6.0 feet will extend the evacuation of flood waters from the Lake from 1 October to 15 October. The memo also states that "previous studies indicate a regulating stage of 6.0 feet (2,080 cfs) from May through mid-December can be safely used when the lake is less than 50% full." The request was to continue the deviation to a regulating 6.0 feet at Poplar Bluff through 15 December 1993.

A storm event of 13 to 15 November caused the lake to fill to approximately 58% full (US004004). The Corps determined that the "... prudent thing to do would be

to continue the deviation until the harvest has been completed."

4.1.2 1994 and 1995 Deviations

The White River Ad Hoc Work Group voted on April 7, 1994 to recommend an interim operating plan (US004010) to be in effect until April 15, 1995. This plan (US004012) called for the following flow regulation at Poplar Bluff.

- Regulate to 11.5 feet from 1 December to 14 April.
- Regulate to 8 feet from 15 April to 14 May if Clearwater Lake is 50% full or greater (pool elevation ≥ 544 ft).
- Regulate to 6 feet from 15 May until 30 November except to 8 feet if lake is 70% full or greater (pool elevation ≥ 554 ft).
- Maintain a seasonal Lake pool from 1 May until 15 September at elevation 498 feet with a transition period to elevation 498 feet by 8 October.

The Ad Hoc Work Group approved a continuation of this interim plan through 15 April 1995 (US004019). The Corps approved the implementation of the interim plan on 18 April 1994 (US004007). Approval by the Corps for continuation of the Plan for the period 15 April 1995 through 15 April 1996 was issued 21 February 1995 (US004017).

4.1.3 1996 Deviations

The 1994 and 1995 deviation plan was not continued into 1996, rather the Ad Hoc Work Group voted to

recommend a new operating plan for Clearwater Lake and the Poplar Bluff gage be implemented to begin April 1996 and continue through 15 April 1997. The Ad Hoc Work Group plan was outlined in a letter to Colonel Morris of the Corps dated 17 April 1996 (US004023). This was also presented in a White River Ad Hoc Work Group Interim Plan of Operation Amended: 16 April 1996 (US004030 and US004031). This plan called for the following regulation of discharge from the Lake.

1. Lake pool levels
   - Conservation pool at 496 feet 1 November through 14 April.
   - Pool transition to 498 feet 15 April through 30 April
   - Seasonal pool at 498 feet 1 May through 14 October
   - Pool transition to 496 feet 15 October through 31 October
   - No mosquito control by manipulation of Lake pool elevation.

2. Poplar Bluff regulating stage
   - 11.5 feet 1 December through 20 May
   - 6.0 feet 21 May through 31 May except if Poplar Bluff at 11.5 feet on 20 May continue to empty Lake to an 11.5-foot stage until pool reaches 509 feet OR 31 May, whichever comes first, AND/OR if flood pool refills to greater than 50%, regulate to 11.5 feet
   - 6.0 feet 1 June through 30 June except if pool > 50%, regulate to 10.5 feet
   - 5.0 feet 1 July through 30 November except if pool > 50%, regulate to 10.5 feet.

4.1.4 1997 Deviations

The 1996 approved deviation continued through 14 April 1997 (US004020). On 3 June 1997 a Corps form, the Record of Deviation from Approved Water Control Plan (US004042), suggested that a storm event 31 May through 1 June resulted in a crest of only 5.9 feet at Poplar Bluff. The memo further states "Because of the late date for planting and replanting, and because regulating to the approved plan of 10.5 ft. would actually have induced flooding with releases from the project, we requested a deviation to regulate Poplar Bluff to 6 ft." The request had been verbally approved on June 1. No expiration date of the deviation was given.

4.1.5 1998 Deviations

A verbal approval by the Corps Chief of Reservoir Control Branch was made on 11 June 1998 to a Corps internal email request for a deviation (US004049 and US004050) outlined in paragraph 5 of the email request. The request stated "Based on basin studies, it is recommended that the requested regulating stage of 5.0 feet be used through 1 December 1998 (the end of the agricultural season) as long as the flood storage occupied at Clearwater Lake does not exceed 20% full (elevation 524)."

This approved deviation was also confirmed in a memorandum from Colonel Morris, Commanding Officer, dated 1 July 1998 (US004052 and US004053).

On 7 August 1998 a Corps memo confirmed a deviation just prior to the weekend of 1-2 Aug 1998. Forecasts indicated that the lake flood pool would fill to about

25% necessitating a rise in stage at Poplar Bluff to 11 to 12 feet but expectations were that flow would recede rapidly to less than the approved deviation stage of 5.0 feet causing minimal agricultural damage.

4.1.6 1999 Deviations

The Clearwater Lake/Black River Committee (formerly a sub-committee of the Black River Ad Hoc Work Group) recommended in a letter dated 21 September 1998 (US004058) that the Little Rock District implement new regulating stages for the Poplar Bluff gage in accordance with a SUPER model run W98X05 outlined in an attachment to the letter (US004061). "On 15 September 1998 the committee unanimously approved an alternative WCP for Clearwater Lake" (US004059).

The recommended deviation plan follows.

- 1 Dec to 14 May regulate Poplar Bluff to 11.5 feet
- 15 May to 30 November regulate Poplar Bluff to 4.0 feet with the following caveats:
- When 16% to 25% of flood storage is in use, regulate to 6.0 feet
- When 25% to 50% of flood storage is in use, regulate to 8.0 feet
- When over 50% of flood storage is in use, regulate to 10.5 feet.

The percent use of flood storage translates to the following lake pool elevations and Poplar Bluff stage.

From mid-May through November the regulating stage at Poplar Bluff depends on lake pool level as follows:

- Pool elevation < 520 feet, target stage is 4 feet;
- Pool elevation between 520 and 528 feet, target stage is 6 feet;
- Pool elevation between 528 and 544 feet, target is 8 feet; and
- Pool elevation > 544 feet, target stage is 10.5 feet.

Approval was granted to implement the proposed Water Control Plan as a long term deviation through 31 December 1999 in a Corps memo dated 7 January 1999 (US004056). The memo encouraged expediting completion of the environmental assessment and required public meetings so that further extensions of this deviation would not be required.

This Plan has also been referred to as the Morris Plan. The Environmental Assessment (EA) was conducted by Parsons Engineering and published in its final form in 2000. (Clearwater Lake Water Control Plan Final Environmental Assessment, Parsons Engineering Science, Inc., Feb 2000.)

Changes in the operating plan (the original Water Control Plan to the deviation, or new, Water Control Plan) result in the following:

- Maximum stage at Poplar Bluff of 11.5 feet can be extended from 1 April to 15 May (six weeks extension). In other words, the stage at Poplar Bluff during the period 1 April through 15 May could be as high as 11.5 feet under the revised plan instead of 10.5 feet under the original plan.
- Maximum stage at Poplar Buff during 15 May 15 through 30 November is reduced from 10.5 feet except when pool elevations are greater

than 544 feet when stage can be as high as 10.5 feet.

- Stage at Poplar Bluff during the period 15 May through 30 November may be lower than during similar conditions in the original Water Control Plan.

4.1.7 2000 Deviations

A Corps memorandum dated 12 May 2000 approved continuation of what was referred to in the memo as the "temporary Water Control Plan" recommended by the Clearwater Lake/Black River Committee for the period 15 May 2000 to 1 December 2000 (US004065).

The 12 May 2000 memo also stated that the 4.0-foot stage at Poplar Bluff is to prevent downstream agricultural flooding and that the 8-month deviation will be monitored by the Little Rock District and the Arkansas Game & Fish Commission regarding possible impacts to the Dave Donaldson-Black River WMA.

The final Environmental Assessment, published in February 2000 made the following observations with respect to the WMA.

- "According to AGFC, a 4-foot river stage at Poplar Bluff results in a 6-foot stage at Corning, Arkansas and the Dave Donaldson Black River Wildlife Management Area" (US000165). However, no source of the statement or data are provided in support of the AGFC statement.
- The new Plan would result in "11 more days at a 4-foot river stage at Poplar Bluff during the growing season in a typical year."

- A conclusion of the EA is "If there is a direct correlation of a 4-foot river stage at Poplar Bluff to a 6-foot river stage at Corning, 44.6 days during the growing season of a typical year would have the potential for inundation, pending, and/or bank overtopping." The method for determining the duration of 44.6 days in the growing season of a typical year is not given.

4.2 Summary of Water Control Plan Deviations

Deviations to the Water Control Plan have been requested by various parties on an almost annual basis for many years and a summary of the approved deviations and the reasons is presented in Table 1. Through interactions with the White River Ad Hoc Work Group, its sub committee, and later the Clearwater Lake/Black River Committee, the Little Rock District provided assistance and approved requested deviations to the Water Control Plan. Deviation requests varied from year to year. Generally, the requests for 1993 through 2000 were all focused on maintaining a lower stage at Poplar Bluff in the summer. The following summarizes the major aspects of the deviation plan requests for the period 1993 through 2000.

- 1993; a deviation stage of 6 feet during the growing season
- 1994 and 1995; a deviation stage of 8 feet mid April to mid May and 6 feet for the remainder of the growing season
- 1996; a deviation stage of 11.5 feet through 20 May and 6 feet for remainder of growing season unless lake levels exceeded specified pool maintenance elevations

- 1997; a deviation stage of 6 feet during the growing season
- 1998; deviation stage of 5 feet during the growing season
- 1999 and 2000; deviation stage up 11.5 feet to mid May and then 4 feet thereafter if lake pool conditions met for remainder of the growing season.

4.3 Basin Rainfall

One cannot consider just seasonal or annual rainfall totals when drawing conclusions about river stages at Poplar Bluff and Corning and discharges from the Lake. Individual storm events and where they occur in the basin (e.g., in the lower part of basin downstream from Clearwater) can result in increases in river flow that are not related to releases from the Lake. Large storm events can cause high lake pool elevations and releases must be made following the Water Control Plan or the approved deviation plan. Seasonal average release from the Lake may be low reflecting low seasonal rainfall but there may be a large storm event in the Lake watershed that requires short term increases in releases so the flood storage pool can be available in the event of another storm.

Monthly average rainfall over the Black River watershed from the headwater to the downstream boundary of the WMA is presented in Tables 2a and 2b for the period 1963 through 2000. The average basin-wide rainfall was determined by assembling all the raingage records from NOAA and Corps sources (published on the Internet or obtained by contacting the High Plains Regional Climatic Data Center in Lincoln, NE) and plotting their locations on a map

with the basin boundary. A technique commonly used in climatic and hydrologic studies called the Thiessen polygon method (Dingman, S.L. 1994. Physical Hydrology. Macmillan Publishing Co.) was used to calculate average basin-wide rainfall. A polygon was drawn around each raingage location by joining each gage to its nearest neighbor and drawing a perpendicular bisector to form a polygon. The area of each polygon within the basin boundary represented the fraction of the total basin area represented by that raingage. These fractional areas are presented in Table 2a. Multiplying the total monthly rainfall for each gage by its fractional area and summing all gages yields the basin-wide rainfall for each month. Ten raingages cover the basin. Also presented in Tables 2a and 2b is the long term monthly and annual basin-wide average for 1963 through 1992 and 1993 through 2000. The distribution of raingages, the basin boundary, and the WMA are shown in Figure 2.

Table 3 is a compilation of rainfall at the dam and Poplar Bluff for each of the major releases from the dam resulting from significant rainfall events. Rainfall at the dam for 1994 is from Table 4-03 of the Water Control Plan (1995) (US00790) and subsequent years are from NOAA rainfall records. Also presented in Table 3 are the major rainfall events at Poplar Bluff, Corning, and Pocahontas for the same period.

Rainfall in the winter and early spring when soils generally have the lowest available storage capacity result in the greatest increases in pool elevation and the need for increased releases from the lake. There is also increased flow from the intervening basin area between the dam and Poplar Bluff. Table 3 addresses major precipitation events in both the dormant and

growing season. Note that timing of rainfall events across the basin often varies, i.e., a storm that occurs in one location may not occur in another and at other times a storm's timing may lag from one location to another by several days. A storm's timing and duration as it moves across a large basin is critical to determining local flooding, timing of passage of the flood wave downstream, and prediction of the flood wave peak and duration at locations down the river.

5.0 DAVE DONALDSON-BLACK RIVER WILDLIFE MANAGEMENT AREA OPERATION

5.1 Background

The Arkansas Game & Fish Commission's purchase of the land that now comprises the WMA began in the early 1950s with acquisition of about half of the land currently owned. The AGF&C made additional purchases in the late 1950s and early 1960s, 1965 through the early 1970s, and in 1988. The AGF&C floods the WMA Greentree Reservoirs (GTR) each year generally around mid October. The areas outside the Greentree Reservoirs, i.e., the portions of the WMA that are in the Black River flood plain but flooding is not controlled by structures, are subject to the rising and falling stage of the river. The GTR units are referred to as Upper Island, Lower Island, Upper Reyno, Lower Reyno, and Winchester. The total area of the GTR units is approximately 7,050 acres, or 30% of the total WMA area of approximately 23,600 acres (GTR and total areas determined from maps and boundaries prepared by Nutter & Associates from AGF&C documents). The entire WMA is further divided into compartments for habitat management. A map of the WMA showing the GTRs is shown in Figure

3 and the compartments are shown in Figure 4. Compartment boundaries generally follow natural topographic features or section lines and are divided into stands which often represent a management unit or ecological unit. The Black River flows generally from northeast to southwest through the WMA.

5.2 Water Management on the WMA

The following description of the WMA is taken from Plaintiff's Supplemental Response to Interrogatory No. 6, 24 March 2006.

Procedures for management of the GTRs have evolved over the years as structures have been added and modified. Development began in the up stream portion of the WMA with the construction a concrete stop-log structure in the Upper Island GTR to create sufficient stage in the Little River to begin flooding the GTRs. In 1960 an earthen dam was constructed in the Little River at the stop-log structure. In 1971 the stop-log structure and earthen dam were replaced with a 6-bay concrete stop log structure and new earthen dam. In the 1980s new boarded pipes were installed to help drain water from the sloughs and lower elevations in Upper Island. Development of structures in the Reyno and Winchester GTRs began in the 1960s. Siphons were installed in 1961 under the Black River from the Island GTRs to the Reyno GTR. Two additional siphon pipes were installed in 1968-69 to move water from Reyno into the Winchester GTR.

Typically the Little River stop-logs are placed in the dam around the middle of October. Dewatering begins in February and drains as the river stage falls. Dewatering consists of removing the stop-logs in the

Little River structure so water is not directed into the WMA by the structure, opening screw-type valves on culvert structures, removing stop-logs on other structures, and clearing washed-in debris, and removing debris in structures and sloughs caused by beaver. When the river stage is at a level that drainage (i.e., dewatering) occurs it takes approximately two weeks for the GTRs to be void of most surface water.

The following description of how the GTR flooding occurs is quoted from Plaintiff's Response to Interrogatory No. 6, 24 March 2006.

> "The Green Tree Reservoirs (GTR's) on the Wildlife Management Area are flooded entirely by gravity flow. Flooding begins by damming up Little River generally around mid October. Water is diverted into the GTR and held behind the levee system of the Upper and Lower Island GTR's. This creates 'head pressure' that forces water through two 48 inch pipes (inverted siphons) referred to as the Upper Siphons that run under Black River. These inverted siphons send water to the Upper Reyno GTR and is held back by a meandering levee that follows a natural contour referred to as the Reyno Cross Levee, the natural levee along the riverbank and several sloughs that contain earthen dams. There are two 48-inch boarded pipes in the Reyno Cross Levee and a large 8 bay concrete structure with gates at the the Reyno Parking Lot. Water builds and then flows into the Lower Reyno GTR and is contained by a large 8 gate structure in the levee at Canoe Slough and (1) 48 inch pipe at Black River at the end of what is referred to as the Mervin Levee (the levee gets its name from the section of river it follows known as Mervin

Straight). Water is contained behind this levee and then enters a second set of inverted siphons known as the Lower Siphons. From here water flows from the GTR north of Lake Ashbaugh and is contained by a large 3-gate structure at the the Canal Access and by the natural levee along Black River and a man made levee system that runs east and west to the north of Lake Ashbaugh. This compartment is generally referred to as the Rest Area because the Rest Area comprises the bulk of this GTR. The water is held back by a boarded tank car structure in an intermediate levee known as the stub levee. Water spills around it into what is referred to as the Winchester Area. The water continues on until it reaches a large 3-gate structure known as the Crane Roost Structure and the adjoining levee referred to as the Redline Levee by some and 24B levee by others. This levee runs due north until it reaches higher ground and stops. There is one 48 inch screw gate pipe in this levee and a rock spillway/boat crossing was added beyond the screw gate. Water flows into the last compartment, generally referred as 24 because it lies in section 24. The water is contained by the 24 levee that runs along Black River just down stream from Shaeffer's Eddy. When this section is full it simply spills over the bank into the Black River."

The following is the schedule of flooding and dewatering for the period 1993 through 2000. The first date is when flooding was initiated and the second date is when structures were opened so the WMA could drain.

1993 - September 27 through February 4, 1994
1994 - October 5 through March 21, 1995

1995 - October 26 through February 4, 1996
1996 - October 9 through February 23, 1997
1997 - October 8 through February 24, 1998
1998 - October 12 through March 17, 1999
1999 - October 8 (on or about) through March 31, 2000
2000 - October 11 through February 15, 2001.

5.3 Corning Stage Elevations and Flooding of the GTRs

There are at least two reports of what the river stage at Corning must be to cause water to flood the GTRs. Heitmeyer in his June 2006 (expert report prepared for Plaintiff) states that "A 5 feet gauge reading at Corning is the point at which surface water begins to inundate the lowest elevations of the Intermediate BLH habitat zone..." An email message (AGFC000082) from Bradley Carner of the AGF&C to Donny Harris, Robert Leonard, and Robert Zachary, also with AGF&C, dated March 15, 2000 describing issues with the authorized deviation plan (referred to as the Morris Plan) in comparison with the original Water Control Plan states that the red oak, white oak, and overcup oak communities begin flooding when the Corning gage is approximately 4.5 feet. He also states that a 4-foot stage at Poplar Bluff correlates to approximately 5.5 to 6 feet at Corning.

A 2001 draft report by ATOKA, Inc. for the AGF&C titled "Review of Available Data and Recommendations" for the WMA (AGFC001744-001766) was cited by Heitmeyer (2006). The ATOKA report states (page AGFC001751) "When the river is below 5 foot at the Corning gauge, trapped waters

within the management area will begin the drain to the river."

Heitmeyer (2006) and stated that a 5-foot stage at Corning was the point at which surface water begins to move into the WMA and Carner (AGFC 000082) identifies a 5.5- to 6-foot stage. In the analysis to follow, I have chosen the mid-point of the 5.0- to 6.0-foot range in stage, i.e., 5.5 feet, that flooding of the WMA begins to evaluate the Corning gaging station records for the period 1993 through 2000.

6.0 BLACK RIVER FLOW, STAGE AND RAINFALL RELATIONSHIPS

6.1 Streamflow Records

The Black River is gaged at several locations upstream from the Dave Donaldson-Black River WMA. Discharges from the Lake are measured and reported by the Corps of Engineers and stage and discharge measurements are maintained by the U.S. Geological Survey (USGS) at the Poplar Bluff and Corning stations. The Corps also maintains daily pool elevation records of Clearwater Lake. There are also stream gaging stations on the Black River downstream of the WMA. The streamflow (discharge) records are available by directly contacting the agency or from postings on the Internet. At the Poplar Bluff and Corning stations stage is measured directly at discrete time intervals and converted to flow in ft^3/sec (cfs) by use of a rating curve that relates measured stage to a measured flow in cfs. The stage and streamflow records used in this analysis are the average daily values, which is the common agency practice for reporting these data. Stage values for Corning and

Poplar Bluff were obtained from the Corps of Engineers, Little Rock District. Average daily discharge records are available from the USGS.

6.2 SUPER Model Predictions

In addition to the measured discharge and stage records used in the evaluation reported herein, the Corps also maintains predictions of discharge in the Black River at Poplar Bluff and Corning using the SUPER model. Daily discharge values predicted by the SUPER model were converted by Nutter & Associates hydrologists to stage at Poplar Bluff and Corning using the published stage-discharge rating curve available from the Corps Little Rock District. The SUPER model is a Corps derived model used to predict the flows downstream from the dam given the actual discharges from the dam, inflow into the lake, and rainfall-runoff relations for the intervening area (non regulated area) between the dam and the river gaging stations at Poplar Bluff and Corning for the Water Control Plan authorized in 1950. It is not a forecast model but rather a type of feedback model in which known rainfall, inflows, and discharges are input to predict what the discharge at Poplar Bluff and Corning would have been if the Water Control Plan was adhered to without deviations. The predictions of discharge are also made further downstream as part of the Corps overall river and reservoir management program for the White River basin. The SUPER model therefore provides insight into what the downstream flow may have been without a deviation. Because the model is a feedback-type, there is a fairly good correlation between actual and predicted discharge when there is no deviation but, as with any hydrologic model, errors in prediction do occur. However, as can be seen from

graphs of observed and SUPER predicted flow and stage to be presented, the error is often small and certainly less than models that predict the future without the benefit of the post-event feedback.

6.3 Observed and Predicted Discharge and Stage at Poplar Bluff with Deviations

Figures 5 through 12 are plots of the observed river annual discharge and stage and the SUPER predicted discharge and stage at Poplar Bluff for 1993 through 2000. The deviations from the 1950 Water Control Plan are shown by vertical lines to indicate when the deviation started and ended (if the deviation is within the period depicted on the graph) and the horizontal line on the stage graph is the deviation stage described in Section 5.

The following is a discussion of the comparisons of discharge and stage with approved deviations (observed discharge and stage) compared to the discharge and stage that would have occurred without deviations as forecast by the SUPER model. For the purposes of this discussion, releases from the Lake due to deviations to the Water Control Plan are identified when the observed stage at Poplar Bluff and Corning is higher than that predicted by the SUPER model.

1993 - Other than weekend deviations requested for a river festival in the summer, the only approved deviation during the growing season occurred beginning in October (Table 1) to provide flooding relief to farmers within the basin. Precipitation was nearly four times more than the average during September (Table 2b) including a flood event at the end of the month at Poplar Bluff (Table 3). Figure 5

shows where the release of water was delayed (OBS) rather than released according to the Water Control Plan (SUPER) in October.

1994 - Extended release timing was observed throughout much of June and July (Figure 6). The SWCC interim plan called for lower target stages throughout April and May (Table 1), a time in which there was nearly two times the normal precipitation throughout the basin (Table 2b). Much of observed precipitation occurred in the upper portion of the basin, including several flood events in April and May (Table 3).

1995 - Precipitation from May through July was nearly double normal throughout the basin (Table 2b). Two large flood events were recording in June and July in the upper portion of the basin (Table 3). The SWCC interim plan was still in place throughout the growing season, and Poplar Bluff target stages were lowered throughout May and June, resulting in extended release times through the end of June and into July (Figure 7).

1996 - A new interim plan was initiated in 1996, and resulted in lowered extended releases through the much of June (Figure 8). Precipitation in April and May was higher than normal, and there were three large flood events within the basin during this time (Table 2b and 3). There were two additional flood events that took place in September (Table 3), which led to prolonged releases into October (Figure 8).

1997 - To aid in the control of public facility flooding, a brief deviation was approved during June (Table 1). Just prior to the deviation, the central portion of the

basin experienced higher than normal rainfall for the previous two months, including a flood event at Poplar Bluff (Tables 2b and 3). This resulted in prolonged releases through the end of June (Figure 9).

1998 - Precipitation in June and July was the highest on record in the basin (Table 2b). One of the many flood events recording during these two months was over nine inches (Table 3). Approval for a deviation was granted to aid local farmers (Figure 10). The deviation resulted in retention of water from June through August, and prolonged releases through the end of September.

1999 - The alternative deviation plan was in place throughout 1999 (Table 1), and there was little in the way of prolonged releases (Figure 11). Upper basin flood events in April (Table 3) may have led to the brief extended release observed in early May (Figure 11).

2000 - There were little or no examples of prolonged releases due to any deviations (Figure 12). The failure to meet target stage at the end of June was likely due to a flood event that occurred in the upper portion of the basin (Table 3).

6.4 Observed and Predicted Discharge and Stage at Corning with Deviations

Figures 13 through 20 are plots of the observed discharge and stage and the SUPER predicted discharge and stage for the Corning gaging station. The horizontal line on the graph is the stage at which the WMA has reported (but not verified by reported studies) flooding begins in the WMA. Heitmeyer (2006) stated that a 5-foot stage at Corning was the point at

which surface water begins to move into the WMA and Carner (AGFC 000082) identifies a 5.5- to 6-foot stage. I have chosen the mid-point of the three estimates of 5.5-foot to portray on the graphs as the estimate when water begins to flood the WMA.

For the most part, stage at Corning mimicks that at Poplar Bluff as discussed in the previous section (Figures 5 through 12) except there is a several day lag between the two stations. There are two obvious examples where local precipitation at Corning caused a sharp increase in stage not apparent, at least at the same magnitude, at Poplar Bluff. The first example occurred in October of 1998 following a nearly seven-inch storm event at Corning (Table 3 and Figure 18). The second example was in early June 2000 (Figure 20). A flood event of over five inches was recorded in the lower basin near the end of May (Table 3).

The SUPER predicted stage at Corning is that which would likely have occurred had there been no deviations. Comparing the observed stage with the SUPER predicted stage at Corning, one can estimate the changes that may be due to deviation operations. In general the original, 1950 Water Control Plan had an authorized maximum stage at the beginning of the growing season that was higher than most of the deviation plans (refer to Sections 4.1 and 4.2). Thus, under the 1950 plan higher stages could be maintained into the start of the growing season longer than most of the deviation plans which authorized a lower stage going into the growing season. The deviation plans often had a lower stage in the early part of the growing season but a higher stage than expected by the 1950 Plan for various periods of time. Stage at Corning, and therefore at the WMA, was also impacted by storms

apart from any discharges from the Lake. This type of event is evident in 1995 (Figure 15) when several storms would have caused the Corning stage to rise well above the 5.5 stage (over a 10-foot stage at Corning predicted by SUPER in late May and mid-July) and flooding would have occurred in the WMA to a depth greater than the stage resulting from the deviation operations. Storm events in late June and early to mid July would also have resulted in a high stage at Corning under the 1950 Plan, however, the stage was maintained somewhat higher due to the deviation but the total length of time the WMA would have been flooded with and without deviation was only a few days (a few days in mid July as the SUPER stage and observed stage converge at 5.5 feet.

Observing the SUPER stage at Corning compared with the observed stage for other years reveals a similar pattern of SUPER predicted stage varying during the growing season above and below the 5.5-foot WMA flood stage indicting that in many years the WMA would have flooded at times during the growing season. How long the WMA would stay flooded and to what depth during either the SUPER stage or observed stage between 1993 and 2000 is not possible to determine from the record for the reasons pointed out in Heitmeyer's 2006 report that identified the poor condition of structures, inadequate structures, and damming of structures and sloughs by beaver. It is also difficult to determine how rapidly the different depths of flooding in the WMA would drain due to the same reasons cited by Heitmeyer.

Table 4 summarizes the number of days that the stage at Corning would likely have been greater than 5.5 feet as a result of the deviation during the growing

season compared to the same stage expected if the 1950 Water Control Plan had been in effect. The growing season for this analysis is defined as 1 April through 30 September, corresponding with the growing season used by Heitmeyer (2006) and more appropriate to the AGF&C's flooding season of the GTRs of October through February. The periods of potential flooding were determined by totaling the number of consecutive days in which the stage predicted by the SUPER model (the 1950 Water Control Plan) would have been greater than 5.5 feet and the number of consecutive days the actual observed stage during the deviation period was greater than 5.5 feet. In other words, Table 4 summarizes the number of consecutive days during the growing season for each event that the Corning stage would have been above 5.5 feet without deviation and with deviation potentially causing water to flood the GTRs and the flood plain sites in the WMA.

On several occasions between 1993 and 2000, the stage at Corning remained above 5.5 feet for only an additional one to five days due to deviation, and in some cases longer (Table 4). In 1993 and 1999, there were no occasions where approved deviations prolonged higher stage at Corning. And as shown in Table 4, there were multiple time periods when the stage at Corning would have been greater than 5.5 feet in the absence of plan deviations. In one case (1996) the stage would have remained above 5.5 feet for 78 days days due to basin-wide rainfall, with or without any deviations to the Water Control Plan.

When the stage at Corning falls below 5.0 or 5.5 feet the GTRs should begin to drain beginning with the most upstream areas first (Upper Island GTR) if the

water control structures across the GTR are open and not clogged with debris. If all are open and not clogged, one could expect the rate of drainage to be similar to that observed during the water level study conducted in 2006 and 2007 by Nutter & Associates (refer to Section 7.0). However, as described earlier in this report and by Heitmeyer (2006) there were a number of issues restricting rate of drainage in the GTRs and the occurrence of beaver in sloughs within the GTRs and in the flood plain portions of the WMA.

7.0 WATER LEVEL RECORDERS INSTALLED ON THE WMA IN 2006 AND 2007

We installed water level recorders on the WMA in November of 2006 to measure the depth of inundation and decline of the water table in the upper two feet of the soil. The objective of the study was to determine the depth of water during flooding, the rate of drainage when the river stage falls, GTR and flood plain flood stage correlated with the Corning river stage, and the rate at which the water table declined after surface water was removed.

A total of six recording devices were installed in the GTRs; one in Upper Island GTR, one in Lower Island GTR, two in Upper Reyno GTR, one in Lower Reyno GTR, and one in Winchester GTR. One was also installed in the flood plain at Shaeffer's Eddy. In January 2007 a water level recorder was installed in the flood plain at Gar Slough (installation was not possible in November of 2006 due to high water stage in the flood plain). In addition to the devices installed in the soil in the GTRs and flood plain, a device was also installed on the staff gage at Brookings Landing on the Black River and on the staff gage at the Hubble

Launch on the Little River. The elevations of the measured water levels at Brookings and Hubble were corrected to the staff gage elevations at each location. A device was also installed on a post adjacent to the ramp at Schaefer's Landing on the Black River but a reference elevation was not determined. The location of all the water level recorders is shown in Figure 21.

During sites visits in late 2005 and early 2006 WMA Lou Hausman of the AGF&C identified to us sites in the GTRs, Shaeffer's Eddy, and Gar Slough that, in his opinion, had greatest damage to timber from flooding during the period 1993 through 2000. The water level recorders were installed at the identified locations with AGF&C Mr. Hausman and the AGF&C consultant, Dr. Overton, present.

We set the water level recorders at each station to record the water depth (either above or below the surface) every twelve hours from the date of installation in November 2006 through removal in September 2007 except January 2007 through September 2007 for the Gar Slough location. Daily water level data for each station is presented in Figure 22 for the Brookings and Hubble staff gages and Figures 23 through 26 for the GTR and flood plain locations. Also included in these figures are daily Black River stage data at Corning, ground surface elevation at the water level recorder (estimated from LiDAR data available from the Corps Little Rock District), and to represent local rainfall, the daily rainfall at Pocahontas and Corning. The objective of these plots is to show how the different areas within the WMA respond to flooding, drawdown, changes in the Black River stage at Corning, and local precipitation.

The recorders were not installed in time to observe flooding of the GTRs in October 2006 when the AGF&C intentionally floods the WMA, but the data indicate that the flood control structures were in place in November. Note that as the stage at Corning rises and falls, there is a change in stage at the GTR stations in November, December, January, and into February but the magnitude of change is somewhat muted compared to changes after mid to late February probably because the stop-logs were still in place the structure at Little River and dewatering of the GTRs had not started yet. Stage rise and fall in the GTRs and flood plain sites were similar to that of the river at Corning from February through the end of September.

There is approximately two to five days lag time between peaks at Corning and peaks at the WMA as observed at the Little River and Brookings staff gages. For example, view the peak in early May on Figures 22 through 26. All of the water level recorder stations showed a two-day lag with the exception of Winchester (four days, Figure 25), Gar Slough (five days, Figure 26), and Schaeffer's Eddy (five days, Figure 26). Schaeffer's Landing (the recorder in the Black River) had a lag of four days. This is a logical progression across the WMA and flood plain considering travel distances down the river reach..

Although the record does not show initial flooding of the WMA in 2006, it does show how different areas within the WMA drain following a drop in stage at Corning in late May and early June (Figures 22 through 26). The number of days it took for the water level to drop to the ground surface at each station following a 5.5-foot stage at Corning are listed below (Figures 22 through 26).

Upper Island GTR	4 days
Lower Island GTR	2 days
Upper Reyno 1 GTR	2 days
Upper Reyno 2 GTR	10 days
Lower Reyno GTR	5 days
Winchester GTR	11 days
Gar Slough	4 days
Schaeffer's Eddy	6 days

Given the flooding progression discussed above, the WMA generally drains as expected. For example, the Winchester GTR would be the last area to flood, and the last to drain (Figure 25). Lower elevation stations tend to drain more slowly. This explains why the Upper Island station drains more slowly than the Lower Island station (Figures 23), and why the Upper Reyno 2 station is one of the slowest areas to drain (Figure 24). It is assumed that the Gar Slough station drains more rapidly because of the presence of the slough and its direct connection to the river. Figures 22 through 26 show that the majority of the WMA drains following a drop in the Black River stage in a matter of a few days. Low lying areas and those that drain later in the progression from north to south (up river to down river) empty within five and twelve days.

There were no deviations in releases from Clearwater Lake in 2006 and 2007. In other words, the Clearwater Lake releases were managed in accordance with the 1950 Water Control Plan.

Overall, in 2007 the site drained relatively quickly once river stage dropped. It is likely that the site overall would have drained much more slowly between 1993 and 2000 due to the factors outlined by Heitmeyer (2006) on page 27, e.g., presence of beaver,

poor maintenance or condition of discharge structures, poor construction (high invert elevations of pipes), and debris blockage. Heitmeyer outlines a number of specific remedies some of which appeared to have been implemented after 2000 and before the water level recorders were installed in 2006.

The recorded data also provide an example of the response of each station to local rainfall. The storm event that occurred in early July totaled five inches over the course of three days. Over that same time, rainfall at Corning was less than two inches. As seen in Figures 22 though 26, a major flood event such as that in July 2007 can raise water levels in the WMA well over one foot.

8.0 BEAVER ACTIVITY IN THE WMA

It has been reported in many places in the record and by Heitmeyer (2006) that beaver were abundant across the WMA and presented a problem in controlling water levels, particularly during the drainage cycle. During site visits in 2005, 2006, and 2007 we observed many sign of beaver, both fresh (within a few weeks) and of recent origin (within 10 years or so). Historic beaver influence was particularly evident in the Gar Slough area where numerous stems had been chewed and dead trees were evident from prolonged and somewhat permanent inundation. The WMA began a more intensive beaver eradication program in 2001 and the contract trapper (Nuisance Animal Control, Inc.) reported GPS coordinates of where beaver activity was interrupted by trapping, destroying lodges, etc. The documents provided by Plaintiffs were searched and the trappers' reported locations were plotted on an aerial photo of the WMA. The reported

beaver occurrences are shown on Figure 27. The locations of the water level recording devices, placed in locations that AGF&C personnel identified had the most timber damage, are also shown on Figure 27 for comparison. It is interesting to note that the many of the locations of concentrated beaver activity are the same locations where the WMA has reported the greatest damage to tree growth and survival.

The impact of beaver to the timber crop cannot be overlooked in assessing damage and the long term problem of controlling the animals. Memos in the AGF&C file prior to 2000 mention occasionally the problem with beaver damaging timber and clogging outlet structures. According to the Plaintiff's documents a concerted effort was begun around 2000 to engage a private contractor to trap beaver and destroy lodges and dams. Nuisance Animal Control was contracted to attack the beaver problem. An example of the problems faced with controlling the beaver is illustrated by a memo dated 15 April 2002 from Scott Cagle of Nuisance Animal Control to Robert Zachery of AGF&C (AGFC003430) describing the ongoing problems. After describing the problems with high water in the WMA and the gage levels at Poplar Bluff and Corning, Cagle states "As it is right now I am not happy. I would have liked to have been a little farther into dam removal so some of the silt would have had a chance to come out of the area. However I can not control the weather. Also there will still be quite a few beaver to remove from the tract. Females will now have their young and will want to stay close to their den sites. There will probably be a lot of two year old beaver that have took over the dens where we have already removed the beaver."

The Cagle memo illustrates the continuing problem with beaver control. Although the data presented in Figure 27 are after the 1993 through 2000 time period when the AGF&C claims damage to timber from flooding, the large beaver populations noted in 2000 and subsequent years had to be building prior to 2000. The Kingwood timber cruise data also identifies the presence of beaver and many of the locations mentioned in the Kingwood reports had beaver removed in later years by the trapper. The beaver population, plus the problems with infrastructure mentioned by Heitmeyer (2006) certainly had to contribute to an ongoing problem with tree decline by extending the period of inundation after the river stage at Corning fell below 5.5 feet. There are no data available that we have been able to identify that indicate how much longer drainage (dewatering) may have taken but it certainly extended the period of standing water in the GTRs and the flood plain sites where beaver were know to have occurred.

9.0 GENERAL OBSERVATIONS ABOUT THE HYDROLOGY RELATED SECTIONS OF THE HEITMEYER REPORT

In general, the Heitmeyer report uses stream flow averages for different time intervals related to his, and/or, the AGF&C's concept of when deviations took place during the 1993 to 2000 period and what deviations were actually in place, if any. Instead of using actual stage values, the report estimated stage from stream discharge assumed to correspond to the stage without verification.

The following is a brief summary of several issues identified in the Heitmeyer report.

- The use of the deviation water control plan in Figure 20 (the same figure is in the Environmental Assessment but Heitmeyer does not list the source) for the period 1993 through 2000 is wrong. The plan shown was only in effect in 1999 and 2000. I consider the misunderstanding of how the original Water Control Plan formulated in 1950 and the different approved deviations over the years were implemented throughout the Lake's operation, and particularly during 1993 through 2000, to be a fundamental flaw in the analysis and conclusions of the Heitmeyer report.

- Heitmeyer indicates that a May 2005 study correlated Corning gage readings with water elevations on staff gages in the WMA. At a 5.0-foot Corning gage reading Heitmeyer states that >30% of the Nuttall oak is flooded. However, Table 7 refers to a stage of 5.4 feet to reference GTR staff gages but no other reference given to how the 5.4-foot stage was determined, where the staff gages were placed in the WMA, and the condition of the river stage at the time of the study, i.e., was the stage falling, rising, or steady. The stage condition at Corning during the study is important because of the time lag between the expression of a particular stage at Corning and later at the WMA. In addition, no reference is made to the condition of the water level within the WMA. Was the WMA flooding, draining, or static during the study? A Corning stage of 5.0 feet and 6.0 feet was also used in some of the analyses but no reference was given as to why these stages were cited or the source of information.

- Identifies a continuing problem recognized by the AGF&C with beaver control as well as the AGF&C's failure to properly maintain or improve the installed structures that are of greatest importance in the dewatering phase of the water management strategy on the WMA. The report does not directly recognize that the infrastructure and beaver issues could be a cause of slow drainage of the WMA and potential damage to timber growth. In other words, the Heitmeyer report fails to consider the drainage issues as a potential source for prolonging flooding within the WMA during the growing season, how it may be related to Corning stage, the rate of drainage in the WMA, or the potential for tree damage.

- Although Heitmeyer Figures 9 and 10 are purported to be for Corning stages of 5 feet and 6 feet, they are the same graphs.

- Table 3 shows average number of days in the growing season and dormant season for various periods of time from 1939 through 2004. We disagree that averages are a reliable means of analyzing the data because each year's time of inundation is critical to tree growth and survival, not averages over an 8-year period. We also were not able to verify all the values given in Table 3, but it doesn't matter since we do not agree with the way the data are presented.

- Table 7 identifies staff gages apparently placed in the WMA and elevations for the range of Nuttall oak. The location of the staff gages is not given and no reason why 5.4 and 6.0 feet

selected to compare to the Corning gage. No data are presented for how the Nuttall oak elevation range was determined, why it is always 2.5 feet in relief, how it was correlated with the staff gages, and when the data were collected.

10.0 CONCLUSIONS

1. The objectives of this report were 1) to assess whether deviations to the Water Control Plan for releases from Clearwater Dam affected the frequency and/or duration of inundation in the Dave Donaldson-Black River WMA, and 2) to review and evaluate the report provided by Plaintiff's expert.

2. Information used in developing this report came from a variety of sources, including but not limited to the Water Control Manual for Clearwater Dam developed by the USACOE; correspondence pertaining to deviations of the original Water Control Plan; precipitation, releases from the dam, lake pool elevations, river stages, and stream flow data from the USGA and the USACOE as well as predicted stream flow data from the USACOE, and regional precipitation from the High Plains Regional Climate Center; Plaintiff's expert and supportive reports; data collected on the WMA, and a series of guided site investigations.

3. The total watershed area upstream and including the WMA is approximately 1,897 mi^2, of which just over 50 percent of the contributing flow from this area is regulated by the operation

of Clearwater Dam. The approved Water Control Plan allows for releases equivalent to a 10.5-foot stage at Poplar Bluff from April through November, and an 11.5-foot stage from December through March.

4. Approved deviations to the Water Control Plan have been requested by various parties for flood water control in some fashion. The length of such deviations range from a few days for recreation purposes to the length of the growing season. The deviation plan described in the Environmental Assessment and in the Heitmeyer was not implemented until 1999 and continued through 2000.

5. It is unclear what stage at Corning corresponds to flooding of the WMA. A stage of 5.5 feet was used for this report. Stages ranging from 5.0 to 6.0 feet are referenced in AGF&C documents but no data are provided to support the stage for flooding.

6. Rainfall throughout the basin was considerably higher than average between 1993 and 2000. It is unclear how unregulated contributions (flow contributions from areas downstream from the dam) affect water level in the WMA, but in any case, the flows do influence the stage at Corning whether deviations or the Water Control Plan was in effect or not.

7. Data collected on site during 2006-2007 by Nutter & Associates shows that the WMA drains within a few days provided that the Corning stage is below 5.0 to 5.5 feet. Data were

not provided by the AGF&C to show how and when the WMA floods in comparison with river stage at Corning. There were a number of improvements made to the drainage infrastructure in the WMA post 2000 referenced by Heitmeyer and an intensive beaver trapping program was started that collectively probably improved the rate of drainage (dewatering) as observed during the 2006-2007 study.

8. The SUPER predicted stage at Corning was used to estimate the number of days that flooding would have occurred if the original 1950 Water Control Plan had been in effect compared to observed flows with deviations. Assuming a 5.5 foot stage at Corning corresponds to flooding within the WMA, there were no changes in flood frequency due to deviation. Duration was extended in most cases less than one week. There were no cases in which the duration was extended in 1993 and 1999, and flooding was only extended by one day on two occasions in 2000. There were four periods over the course of the eight-year period in question (1993 through 2000) when WMA flooding was prolonged more than one week.

9. Multiple accounts are provided that document beaver activity and/or poor management/ inadequate water control structures in place between 1993 and 2000. No data was provided to show that beaver or management affected flood duration. Mapping of data provided by the AGF&C beaver trapper indicated a high concentration of beaver activity in the areas identified by the AGF&C as examples of the

most severe timber damage both in the GTRs and in flood plain sites.

CERTIFICATION

Dr. Nutter's has expended 295 hours at a fee of $150/hour plus expenses.

Wade L. Nutter, Ph.D., P.H.

Prepared this 11th day of April, 2008

CERTIFICATION

Dr. Nutter's has expended 295 hours at a fee of $150/hour plus expenses.

/s/ Wade L. Nutter
Wade L. Nutter, Ph.D., P.H.

Prepared this 11th day of April, 2008

Table 1. Implemented Deviations to the Clearwater Lake Water Control Plan (1993-2000).

Deviation				Poplar Bluff Regulating Stage Target	Notes	Reason
No.	Year	Began	Ended	feet		
1	1993	7/1/93	7/5/93	3.5	To Provide Releases for Black River Festival	Recreation
2	1993	9/29/93	12/15/93	6.0	Unless 50% (Pool El 544') then 10.5'	Agriculture
3	1994	4/1/94	4/14/94	11.5		Interim Plan, SWCC
4	1994	4/15/94	5/14/94	8.0	Unless 50% (Pool El 544') then 10.5'	Interim Plan, SWCC
5	1994	5/15/94	11/30/94	6.0	Unless 70% (Pool El 554') then 8'	Repairs
6	1994	4/1/95	4/14/95	11.5		Interim Plan, SWCC
7	1995	4/15/95	5/14/95	8.0	Unless 50% (Pool El 544') then 10.5'	Interim Plan, SWCC
8	1995	5/15/95	11/30/95	6.0	Unless 70% (Pool El 554') then 8'	Interim Plan, SWCC

Deviation				Poplar Bluff Regulating Stage Target	Notes	Reason
No.	Year	Began	Ended	feet		
9	1996	4/1/96	5/20/96	11.5	Unless PB is at 11.5 on 5/20, in which case continue to empty until pool reaches 509 or 5/31; and if flood pool refills to >50%, regulate to 11.5	Work Group Plan
10	1996	6/1/96	6/30/96	6.0	Unless 50% (Pool El 544') then 10.5'	Work Group Plan
11	1996	7/1/96	11/30/96	5.0	Unless 50% (Pool El 544') then 10.5'	Work Group Plan
12	1997	6/3/97	7/5/97	6.0	Downstream uncontrolled event at Poplar Bluff Crested at 5.9'	Residential
13	1998	6/11/98	11/30/98	5.0	Unless 20% (Pool El 524') then would be reevaluated	Agriculture
14	1998	12/1/98	5/14/99	11.5	If <16% (pool elevation 520), target 4'; if 16-25% (pool elevation 520-528) target 6'; if 25-50% (pool elevation 528-544) target 8'; if >50% (pool elevation > 544') target 10.5'	Deviation Plan

Deviation				Poplar Bluff Regulating Stage Target	Notes	Reason
No.	Year	Began	Ended	feet		
15	1999	5/15/99	11/30/99	4.0	If <16% (pool elevation 520), target 4'; if 16-25% (pool elevation 520-528) target 6'; if 25-50% (pool elevation 528-544) target 8'; if >50% (pool elevation > 544') target 10.5'	Deviation Plan
16	1999	12/1/99	12/31/99	11.5	If <16% (pool elevation 520), target 4'; if 16-25% (pool elevation 520-528) target 6'; if 25-50% (pool elevation 528-544) target 8'; if >50% (pool elevation > 544') target 10.5'	Deviation Plan
17	2000	1/1/00	5/14/00	11.5	If <16% (pool elevation 520), target 4'; if 16-25% (pool elevation 520-528) target 6'; if 25-50% (pool elevation 528-544) target 8'; if >50% (pool elevation > 544') target 10.5'	Deviation Plan
18	2000	5/15/00	11/30/00	4.0	If <16% (pool elevation 520), target 4'; if 16-25% (pool elevation 520-528) target 6'; if 25-50% (pool elevation 528-544) target 8'; if >50% (pool elevation > 544') target 10.5'	Deviation Plan

Table 2. Weighted basin-wide monthly precipitation for the Black River basin (1963-2000).

Representative area determined by Thiessen polygon method

Precipitation Gage Location	**Representative Area**	
	Acres	**Factor**
Pocahontas	25,132	0.02
Corning A	60,269	0.05
Corning B	49,919	0.04
Qulin	87,302	0.07
Poplar Bluff A	93,370	0.08
Poplar Bluff B	64,074	0.05
Appapello Dam	25,590	0.02
Williamsville	146,829	0.12
Clearwater Dam A	86,361	0.07
Clearwater Dam B	81,934	0.07
Ellington	137,421	0.11
Centerville	283,981	0.23
Belleview	71,876	0.06
Total	**1,214,058**	**1.00**

Table 2. Weighted basin-wide monthly precipitation for the Black River basin (1963-2000) continued.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	inches												
1963	0.85	0.52	5.91	1.63	5.96	4.35	4.39	3.51	1.15	0.11	4.96	1.21	34.55
1964	1.20	3.01	8.58	4.34	2.83	2.57	4.17	5.32	5.03	0.13	2.57	2.10	41.85
1965	2.74	2.80	3.17	4.17	4.43	3.36	3.15	2.71	11.32	0.50	1.90	2.98	43.23
1966	4.71	4.65	1.10	7.87	4.67	2.23	3.39	4.65	4.62	2.08	3.18	3.74	46.87
1967	2.10	2.46	1.90	3.23	4.99	3.55	2.59	1.20	3.56	4.45	2.51	7.52	40.08
1968	2.21	1.57	5.91	5.00	5.05	1.86	4.61	2.18	3.73	1.52	6.33	5.68	45.66
1969	8.02	2.26	3.00	5.26	1.99	2.31	3.28	1.75	4.33	3.43	1.88	3.85	41.36
1970	0.72	2.03	5.19	5.18	4.46	6.31	2.15	4.14	4.84	4.19	2.07	2.88	44.15
1971	3.10	3.43	1.41	1.96	3.81	3.44	2.92	2.73	1.78	0.54	2.44	7.09	34.65

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	inches												
1972	2.06	2.51	2.09	6.70	3.09	2.12	5.75	2.83	6.81	5.05	7.48	4.99	51.49
1973	3.78	2.16	8.63	9.27	7.62	4.83	3.21	3.39	4.02	4.75	7.96	5.54	65.17
1974	3.54	2.81	4.36	4.18	6.44	3.10	1.69	5.31	3.90	2.05	5.39	2.14	44.91
1975	4.43	1.65	8.75	3.79	2.88	4.10	0.97	1.50	1.49	1.37	4.02	4.79	34.55
1976	1.65	2.26	4.21	2.05	2.87	4.92	4.56	1.64	1.11	2.82	0.53	1.18	29.79
1977	1.73	2.09	10.94	3.12	2.88	4.85	2.40	8.27	7.51	2.27	4.78	4.30	55.12
1978	2.30	1.21	5.43	2.07	3.08	2.67	6.48	4.58	0.68	2.13	6.55	4.72	41.91
1979	3.56	4.15	7.20	8.43	7.54	1.83	6.32	2.79	1.71	1.91	5.38	3.51	54.33
1980	1.58	2.31	4.39	2.00	2.82	1.64	1.48	3.14	3.61	3.05	2.38	1.05	29.45
1981	1.01	3.22	2.18	2.60	8.01	4.50	6.72	2.93	1.91	4.30	2.96	2.35	42.69
1982	7.73	2.05	2.53	4.18	3.23	3.75	1.55	9.74	3.52	2.99	4.64	13.29	59.19

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	inches												
1983	0.59	0.70	2.66	8.86	5.68	2.43	1.37	1.34	1.59	5.31	9.06	4.15	43.75
1984	1.08	2.73	4.87	4.89	3.81	2.12	2.97	2.72	5.82	9.92	7.69	7.51	56.10
1985	2.81	3.89	6.29	4.63	4.64	6.38	1.54	4.76	2.08	4.75	9.31	1.98	53.08
1986	0.22	3.47	2.70	5.61	5.90	3.71	4.18	3.12	2.75	3.99	2.19	1.96	39.82
1987	1.39	4.27	3.05	1.86	1.89	4.19	6.04	3.66	2.31	2.07	4.63	8.80	44.16
1988	2.74	2.49	6.09	1.75	2.20	1.74	5.68	2.57	5.83	3.87	7.21	2.50	44.66
1989	3.30	8.61	4.87	2.47	2.73	6.45	3.73	3.93	2.14	1.34	1.27	1.08	41.93
1990	5.01	6.90	4.77	4.39	8.78	1.63	2.51	3.44	2.89	4.57	5.31	8.27	58.47
1991	3.03	1.48	3.80	8.70	4.58	2.07	1.29	3.17	2.86	5.94	5.21	3.74	45.88
1992	1.47	2.54	2.97	4.25	3.91	2.35	5.06	1.69	4.81	1.85	7.89	3.65	42.45

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	inches												
Summary (1963-1992)													
Mean	2.69	1.92	4.63	4.48	4.43	3.38	2.34	2.31	2.41	3.11	4.66	4.29	39.91
St. Dev.	1.88	1.79	2.42	2.30	1.87	1.46	1.55	1.30	1.43	2.07	2.46	2.77	
Max	8.02	8.61	10.94	9.27	8.78	6.45	6.04	6.74	6.47	9.92	9.31	13.29	
Min	0.22	0.27	1.10	1.63	1.89	1.63	0.29	0.57	0.31	0.11	0.53	1.05	

Table 2. Weighted basin-wide monthly precipitation for the Black River basin (1963-2000) continued.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	inches												
1993	5.49	2.26	2.98	4.02	4.74	5.16	2.67	4.16	8.95	3.39	7.18	2.59	53.60
1994	3.96	2.71	3.08	9.20	2.00	4.84	3.57	3.68	2.41	3.11	9.42	3.32	51.31
1995	3.62	2.85	2.84	3.41	6.84	5.31	5.89	2.08	3.25	2.47	2.66	3.39	44.62
1996	3.54	0.83	4.34	6.19	6.22	3.73	3.76	2.06	8.08	2.89	7.83	3.28	52.74
1997	2.31	4.60	5.12	4.47	5.69	4.06	2.31	3.66	3.02	3.04	2.68	2.63	43.59
1998	4.03	3.47	6.91	4.63	3.66	7.55	9.94	2.81	1.44	5.21	2.63	2.35	54.62
1999	5.38	2.73	3.16	6.46	3.61	3.97	1.98	2.53	0.97	2.76	1.31	5.05	39.91
2000	3.57	4.08	2.77	1.52	4.17	6.79	2.75	1.65	3.07	2.47	4.27	2.12	39.24

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	inches												
Summary (1993-2000)													
Mean	3.99	2.94	3.90	4.99	4.62	5.18	4.11	2.83	3.90	3.17	4.75	3.09	47.45
St. Dev	1.04	1.15	1.47	2.30	1.59	1.37	2.65	0.91	2.97	0.88	2.99	0.92	
Max	5.49	4.60	6.91	9.20	6.84	7.55	9.94	4.16	8.95	5.21	9.42	5.05	
Min	2.31	0.83	2.77	1.52	2.00	3.73	1.98	1.65	0.97	2.47	1.31	2.12	

Table 3. Major precipitation events leading to potential floods recorded at Clearwater Dam, Poplar Bluff, Corning and Pocahontas from 1993 to 2000.

Date of Storm			Clearwater Dam		Poplar Bluff		Corning		Pocahontas	
			Rainfall	Duration	Rainfall	Duration	Rainfall	Duration	Rainfall	Duration
Year	Month	Day	inches	days	inches	days	inches	days	inches	days
1993	1	7-9	4.77	3						
	3	31-2			3.31	3				
	4	29-3							3.66	5
	4	30-4	3.20	5	3.05	5				
	6	9-12			3.15	4				
	6	10-12							5.55	3
	9	23-25							3.78	3
	9	23-27	3.92	5						
	9	24-27			4.00	4				
	11	12-17	5.67	6	3.57	6				

Date of Storm			Clearwater Dam		Poplar Bluff		Corning		Pocahontas	
			Rainfall	Duration	Rainfall	Duration	Rainfall	Duration	Rainfall	Duration
1994	1	25-29			3.02	5				
	2	20-23			3.44	4				
	4	10-12	3.26	3						
	4	26-2			3.78	7				
	4	26-30	4.39	5						
	6	24-28	3.23	5						
	7	2							3.70	1
	11	4-5	7.60	2					5.83	2
	11	4-6			4.19	3				
	11	4-6					5.86	3		
1995	4	30-4					3.40	5		
	6	8-12	3.82	5						
	7	23-27	3.60	6						
	12	18-19	3.73	2	3.35	2				

Date of Storm			Clearwater Dam		Poplar Bluff		Corning		Pocahontas	
			Rainfall	Duration	Rainfall	Duration	Rainfall	Duration	Rainfall	Duration
1996	4	20-23			3.40	4			3.10	4
	5	5-11	4.93	7						
	9	16	3.90	1						
	9	24-28	4.00	5						
	11	24-25							3.12	2
	11	24-26	3.80	3			3.34	3		
	12	15-16			3.00	2				
1997	2	26-3	3.83	5			6.02	6	4.45	6
	4	4-5							3.90	2
	4	5-6	3.00	2	3.11	2				
	5	25-2			3.83	9				
	6	29					3.01	1		
	6	14-18	3.47	5						
	8	9-15			4.78	7				

Table 3. Major precipitation events leading to potential floods recorded at Clearwater Dam, Poplar Bluff, Corning and Pocahontas from 1993 to 2000 continued.

Date of Storm			Clearwater Dam		Poplar Bluff		Corning		Pocahontas	
			Rainfall	Duration	Rainfall	Duration	Rainfall	Duration	Rainfall	Duration
1998	1	4-8	4.39	5						
	4	16-17			3.89	2				
	3	16-23			3.75	8				
	3	16-24					3.40	9		
	4	27-30			3.03	4	3.44	4		
	6	5-9	3.57	5						
	6	19-21	5.32	3	5.13	3				
	7	23-26					3.54	4		
	7	23-31	7.73	9	9.27	9				
	7	23-4							3.24	13
	7	29-2					9.00	5		
	8	6-12			3.05	7				

Date of Storm			Clearwater Dam		Poplar Bluff		Corning		Pocahontas	
			Rainfall	Duration	Rainfall	Duration	Rainfall	Duration	Rainfall	Duration
	10	1-6	3.55	6						
	10	6-7			5.31	2	6.42	2		
1999	1	22-23			3.89	2				
	1	22-23					3.52	2	3.02	2
	4	1-6			3.39	6				
	4	1-6							3.54	6
	4	3-6	3.15	2						
	4	14-15	3.15	1						
	5	31-4					3.29	5		
	6	24-2			5.76	9				
	8	8	3.50	1						
	10	8-10					3.84	3	3.92	3
	10	8-11			3.27	4				
	12	6-10	3.02	5						

Date of Storm			Clearwater Dam		Poplar Bluff		Corning		Pocahontas	
			Rainfall	Duration	Rainfall	Duration	Rainfall	Duration	Rainfall	Duration
	12	9-14			6.12	6				
	12	10-14					3.52	5	4.24	5
2000	1	3							3.38	1
	1	3-4			3.39	2	5.44	2		
	2	14-18	3.75	5						
	5	19-27			5.50	9				
	5	25-28					4.55	4	5.20	4
	6	15-22			5.89	8				
	6	19-22	6.03	4						
	9	25	3.42	1						
	10	28-13			4.14	17				

Table 4. Number of days during approved deviations within the growing season (1 April through 30 September) that 1950 Water Control Plan predicted stage (SUPER model) and observed stage due to deviation was above 5.5 feet at Corning.

	Inclusive Dates with Continuous Stage Above 5.5 feet		**Days Stage Above 5.5 Feet**	
Year	**Start**	**End**	**Due to 1950 Water Control Plan**	**Due to Deviation**
1993	09/29/93	09/30/93	2	
1994	04/01/94	06/05/94	66	
	06/06/94	06/08/94		3
	06/09/94	06/12/94	4	
	06/13/94	06/27/94		15
	06/28/94	07/11/94	14	
	07/12/94	07/17/94		6
	07/18/94	07/18/94	1	
	07/19/94	07/23/94		5
1995	04/01/95	04/05/95	5	
	04/06/95	04/07/95		2
	04/30/95	06/05/95	37	

Year	Inclusive Dates with Continuous Stage Above 5.5 feet		Days Stage Above 5.5 Feet	
	Start	End	Due to 1950 Water Control Plan	Due to Deviation
	06/06/95	06/09/95		4
	06/10/95	07/17/95	38	
	07/18/95	07/19/95		2
1996	04/01/96	06/17/96	78	
	06/18/96	07/06/96		19
	08/01/96	08/01/96		1
	08/02/96	08/02/96	1	
	09/28/96	09/29/96		2
	09/30/96	09/30/96	1	
1997	06/03/97	06/15/97	13	
	06/16/97	06/18/97		3
	06/19/97	06/25/97	7	
	06/26/97	06/30/97		5
	07/01/97	07/03/97	3	
	07/04/97	07/05/97		2
	06/13/98	06/13/98		1

Year	Inclusive Dates with Continuous Stage Above 5.5 feet		Days Stage Above 5.5 Feet	
	Start	End	Due to 1950 Water Control Plan	Due to Deviation
1998	06/14/98	06/17/98	4	
	06/18/98	06/20/98		3
	06/21/98	07/04/98	14	
	07/05/98	07/16/98		12
	07/18/98	07/19/98		2
	07/26/98	08/22/98	28	
	08/23/98	09/24/98		33
1999	04/01/99	05/23/99	53	
	06/26/99	06/27/99	2	
	06/29/99	06/30/99	2	
2000	05/26/00	05/26/00		1
	05/27/00	06/03/00	8	
	06/19/00	06/30/00	12	
	07/01/00	07/01/00		1

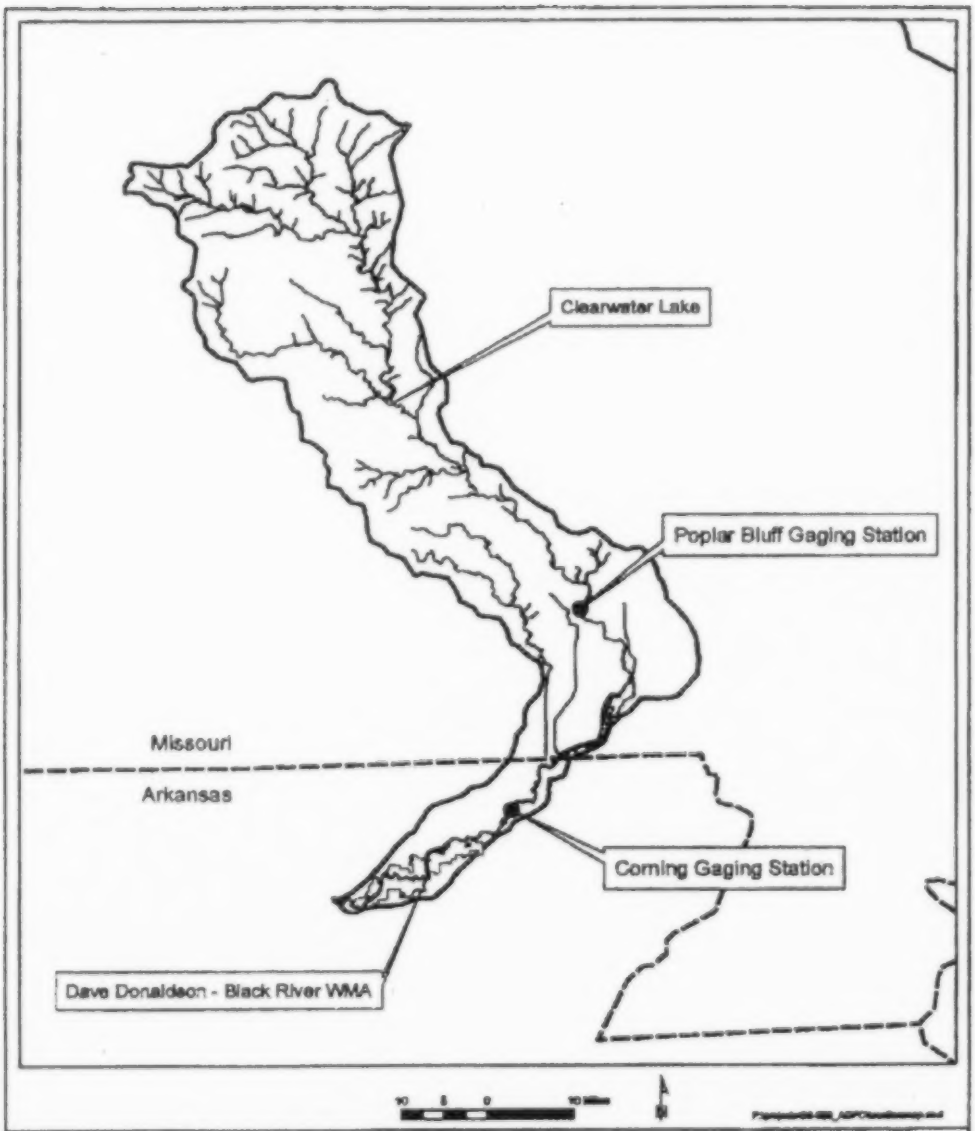

Figure. 1 Black River basin , Clearwater Lake, and Dave Donaldson - Black River Wildlife Management Area (WMA).

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Figure 2. Map of the Black River basin and location of raingages used to calculate basin-wide average rainfall.

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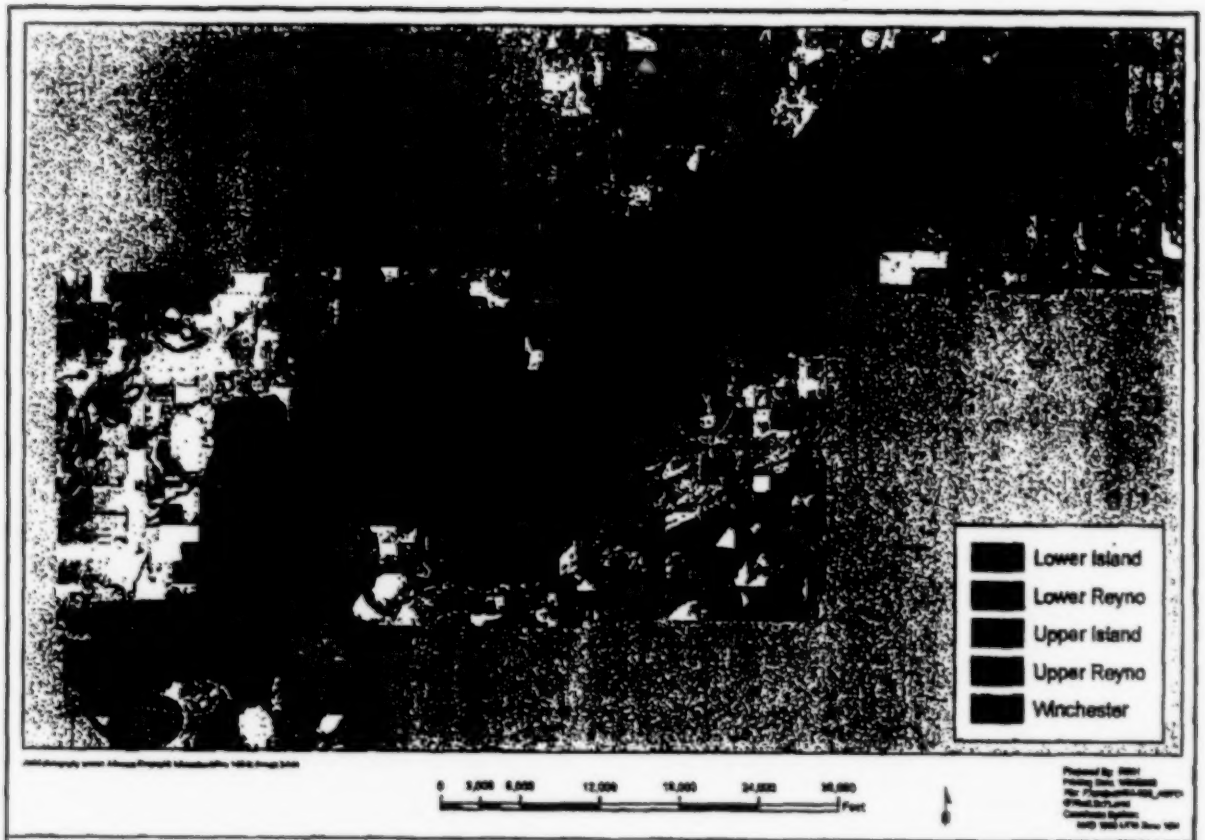

Figure 3. Dave Donaldson - Black River Wildlife Management Area (WMA) and the Greentree Reservoirs (GTR).

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Environmental Consultants

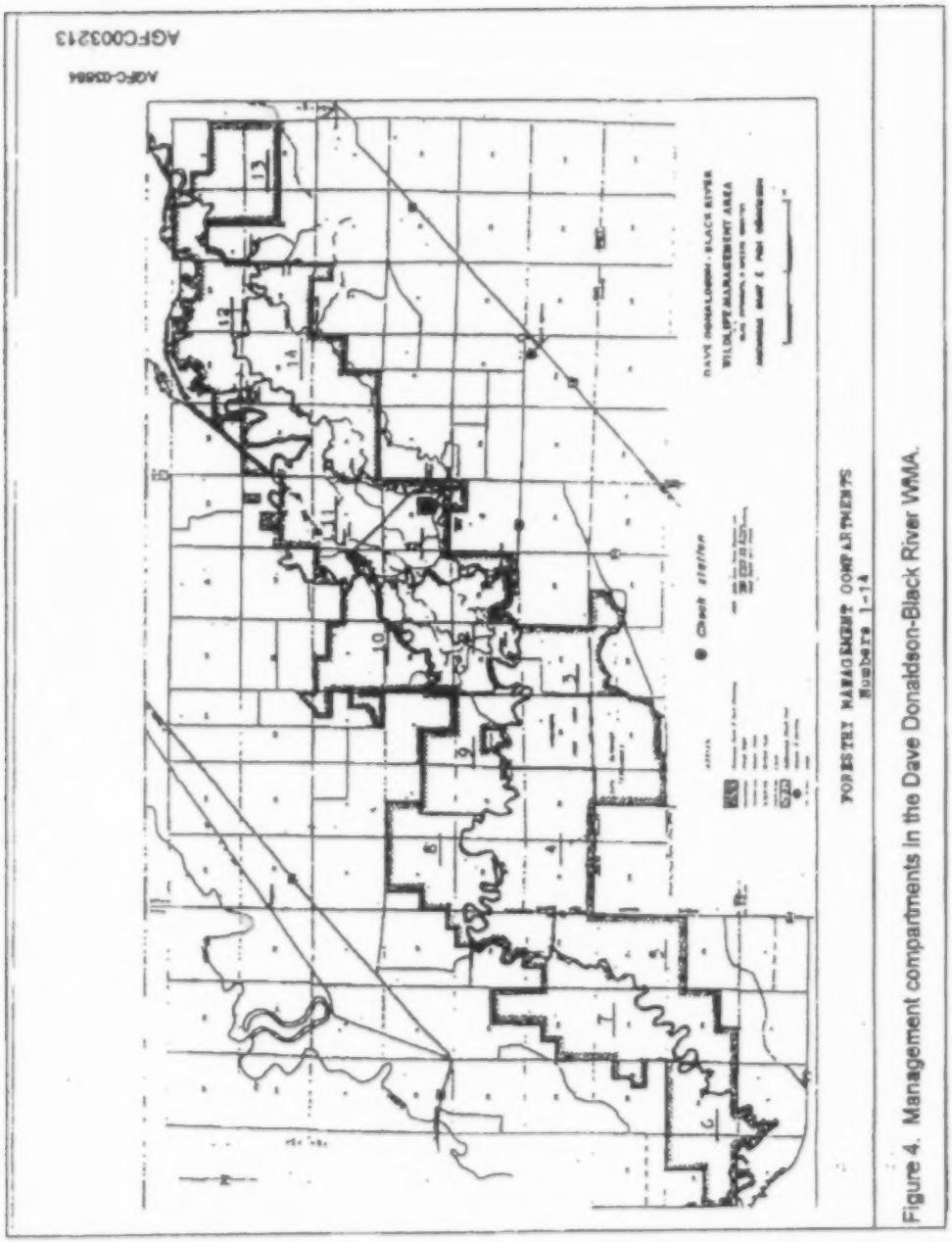

Figure 4. Management compartments in the Dave Donaldson-Black River WMA.

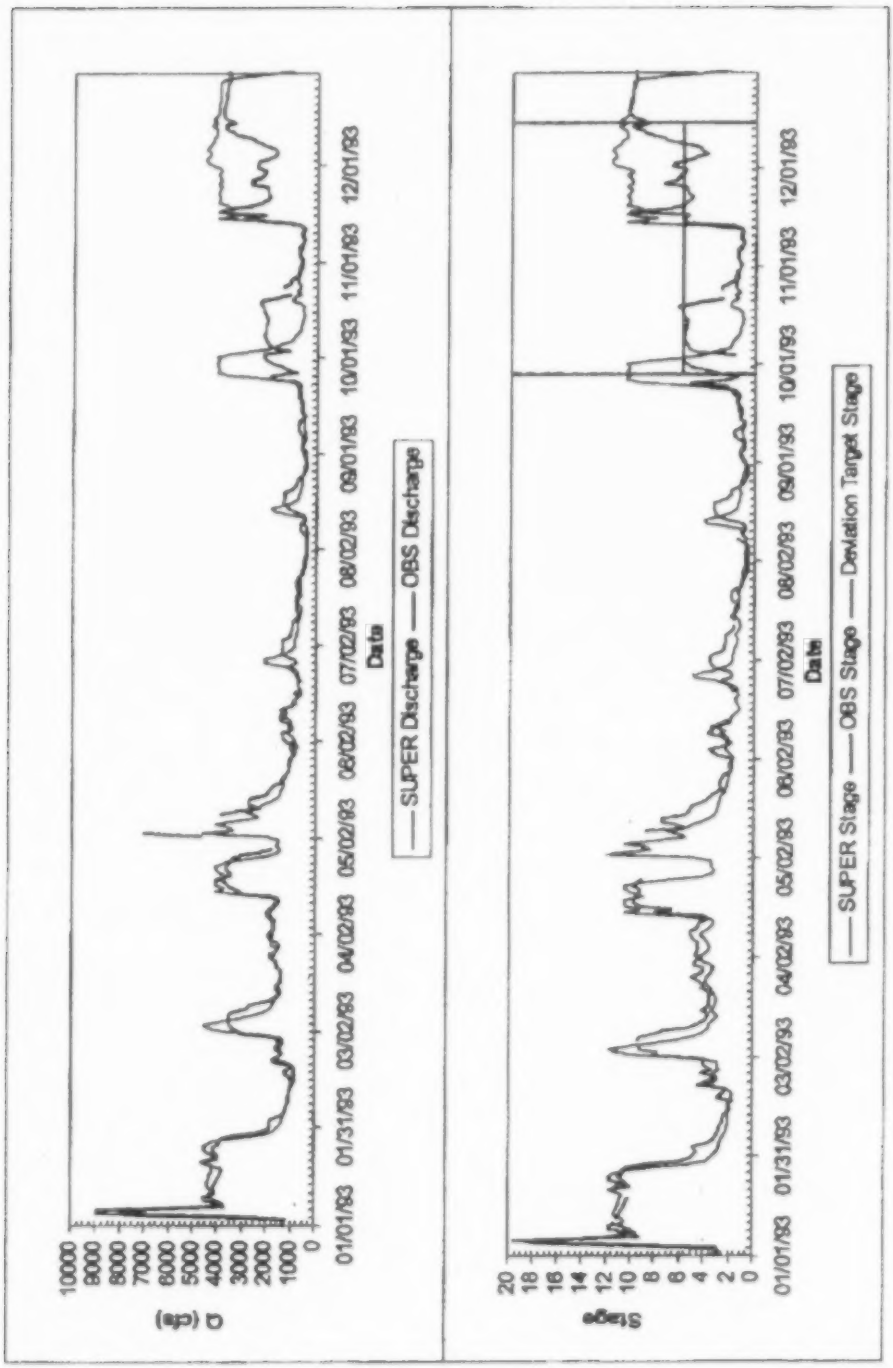

Figure 5. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1993.

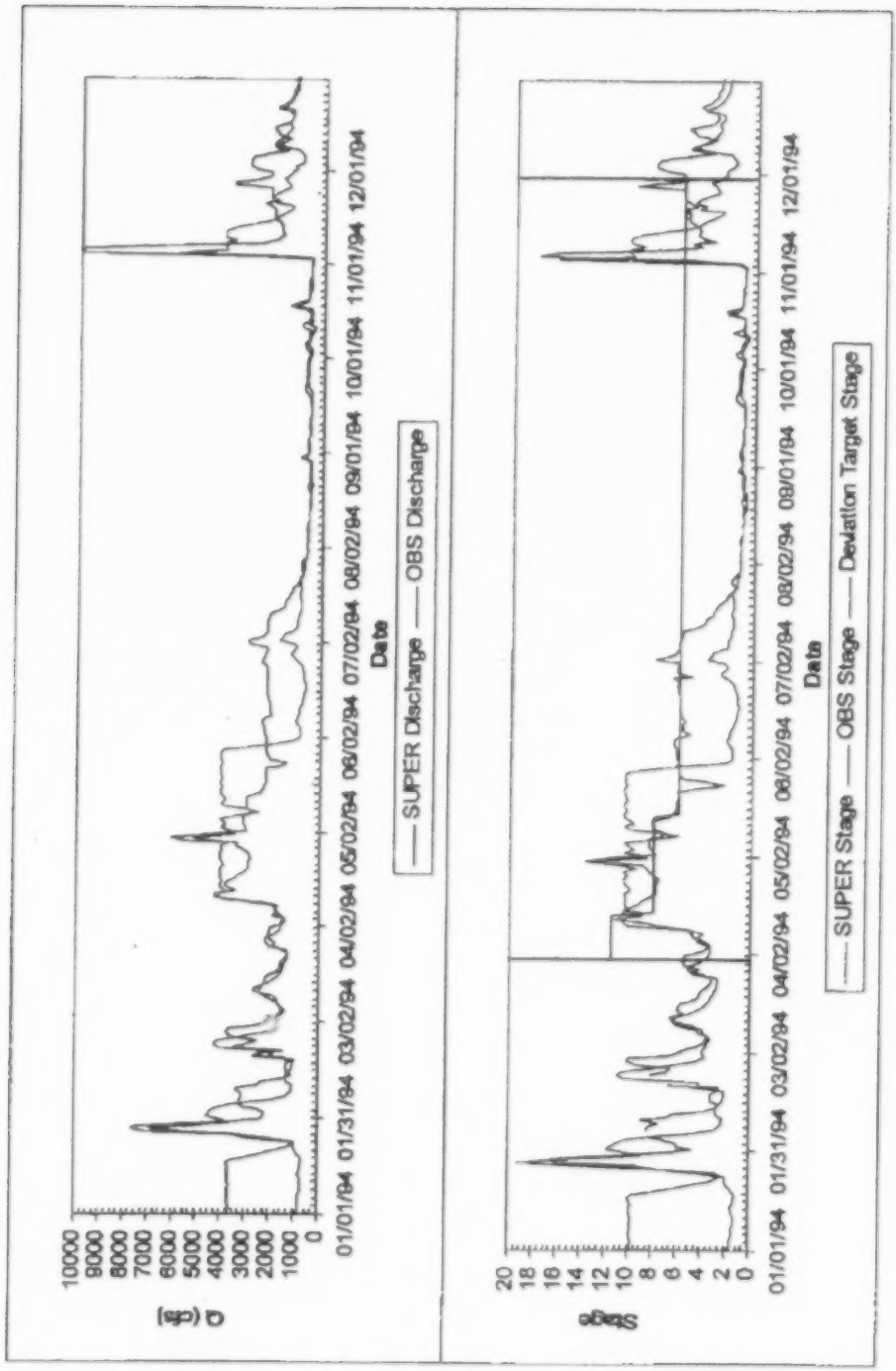

Figure 6. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1994.

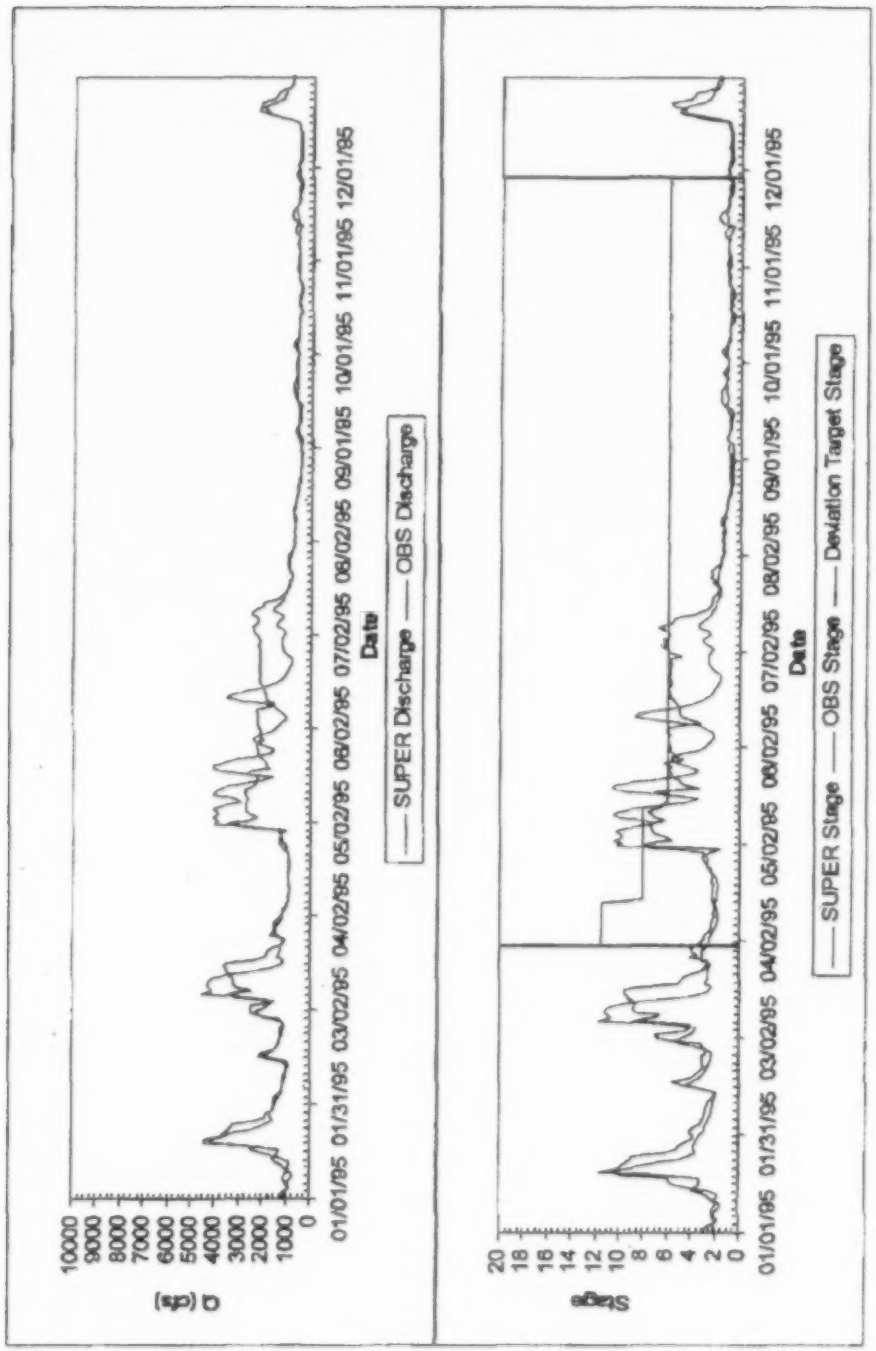

Figure 7. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1995.

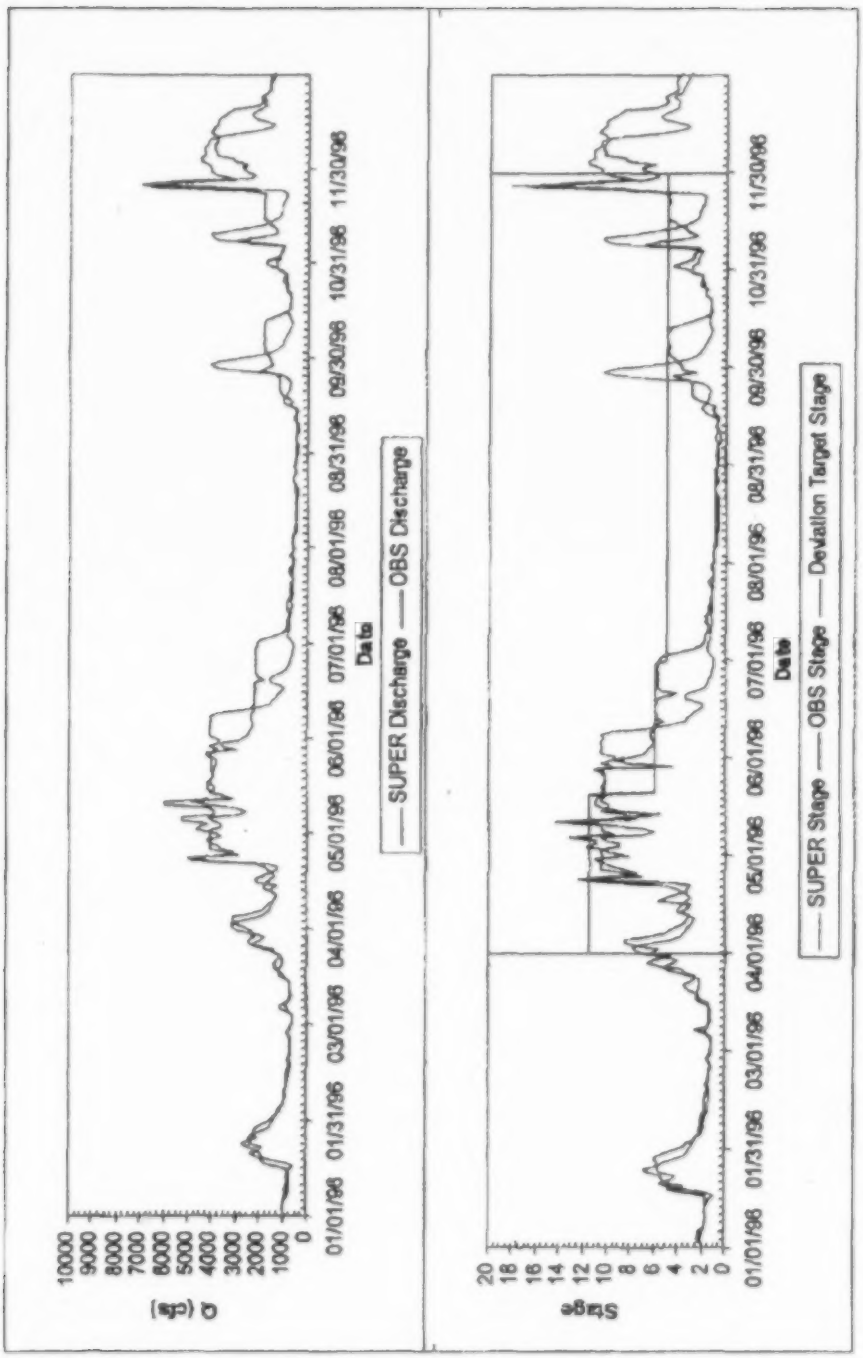

Figure 8. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1996.

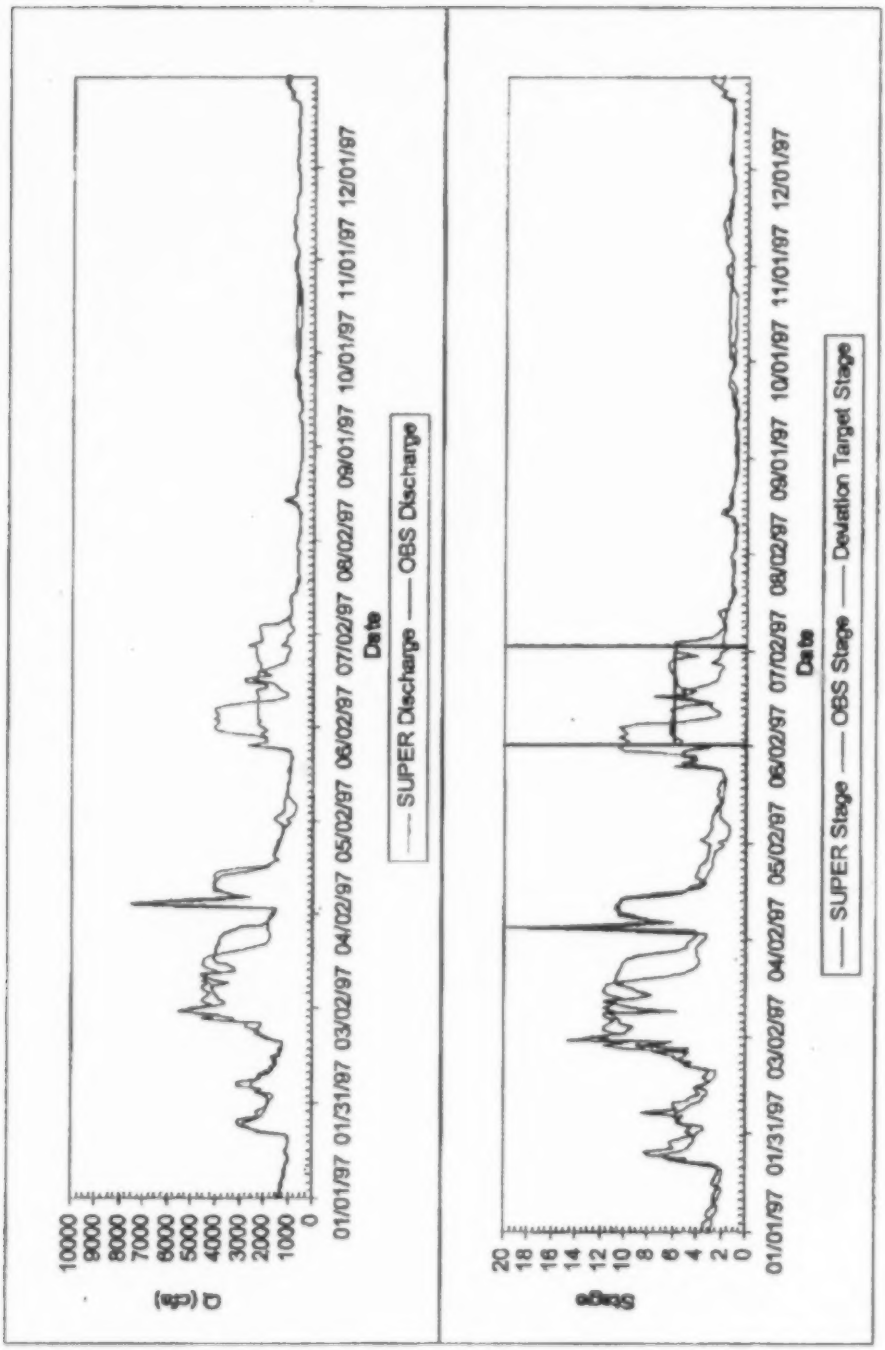

Figure 9. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1997.

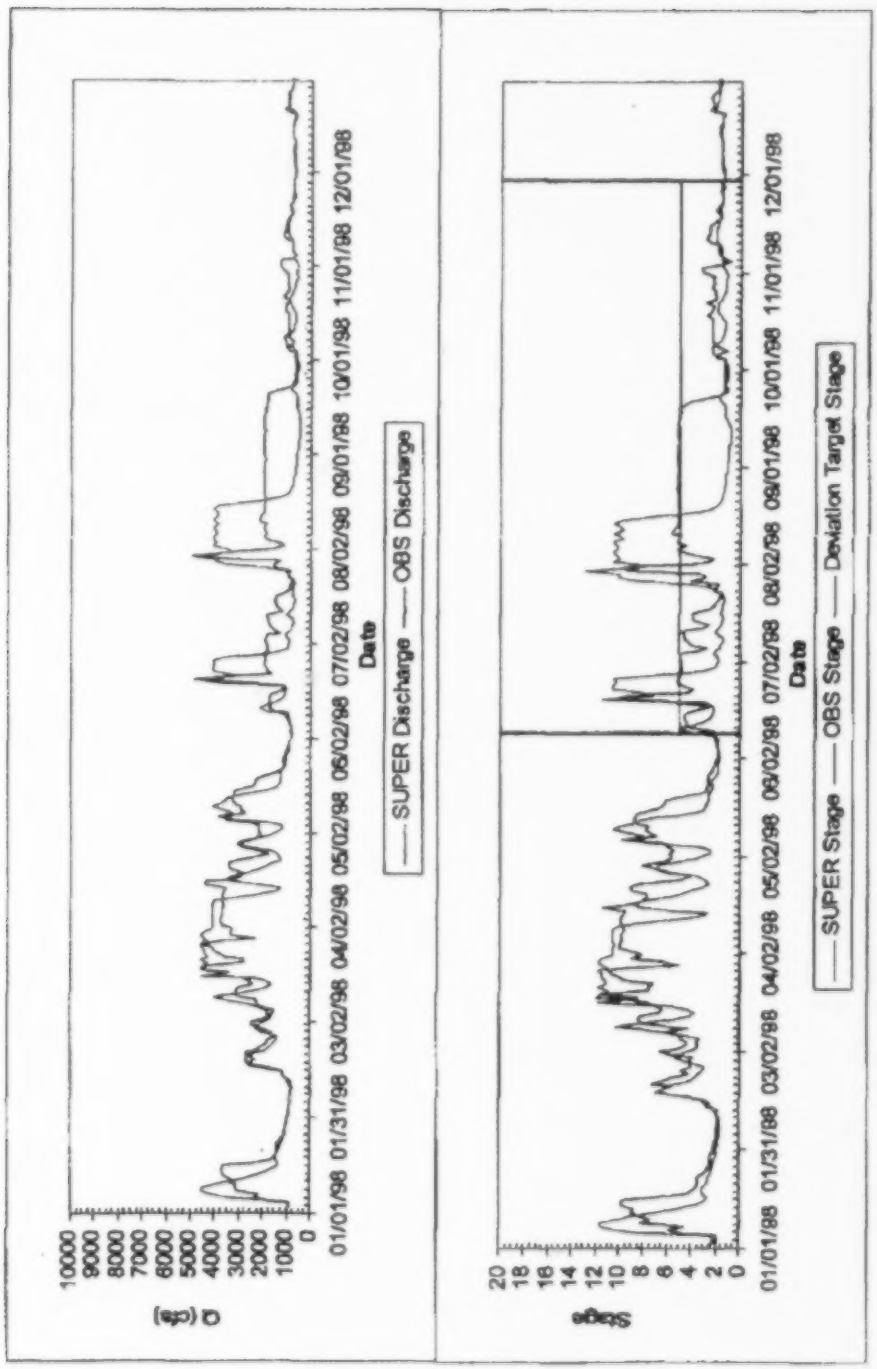

Figure 10. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1998.

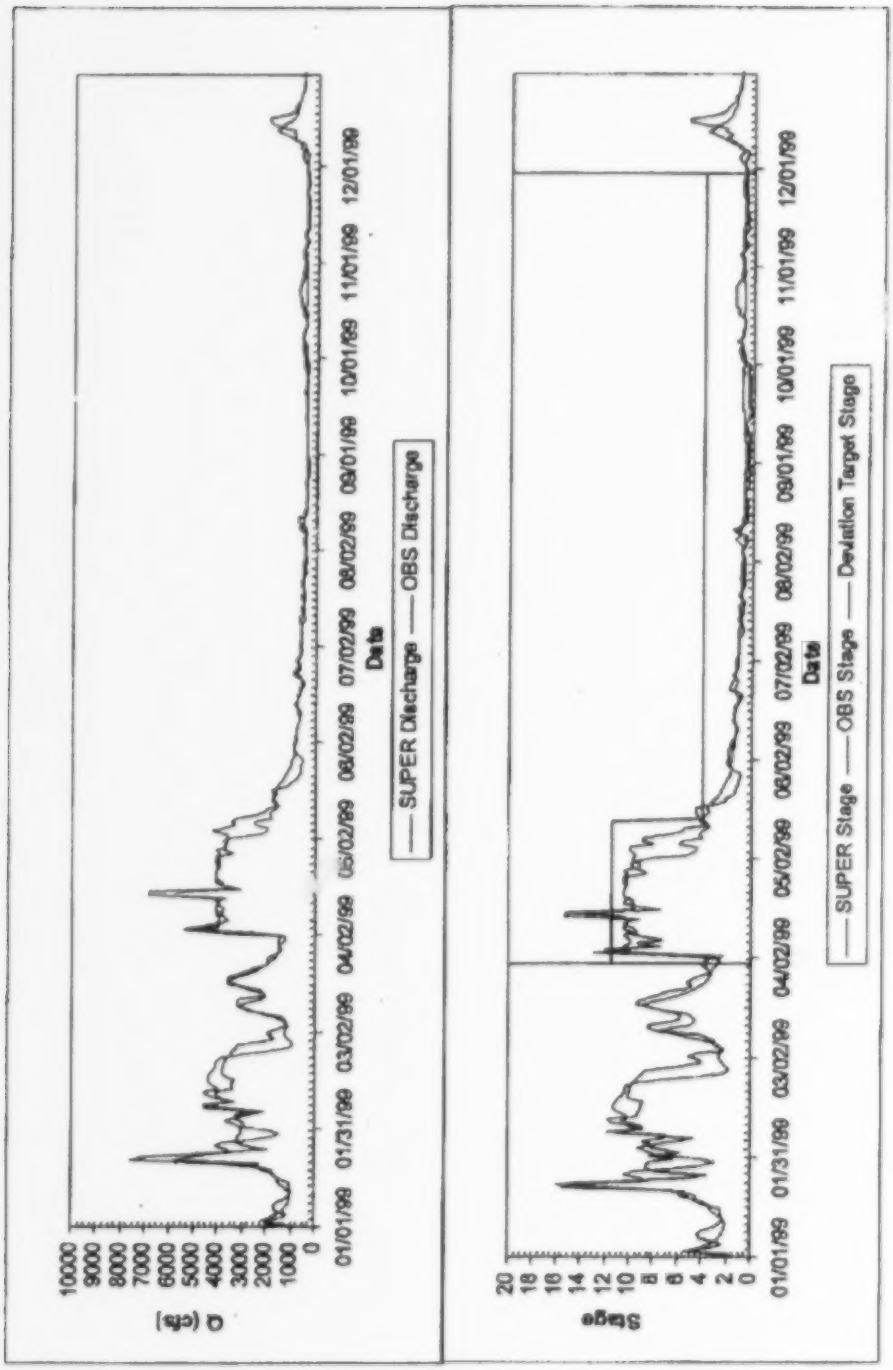

Figure 11. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 1999.

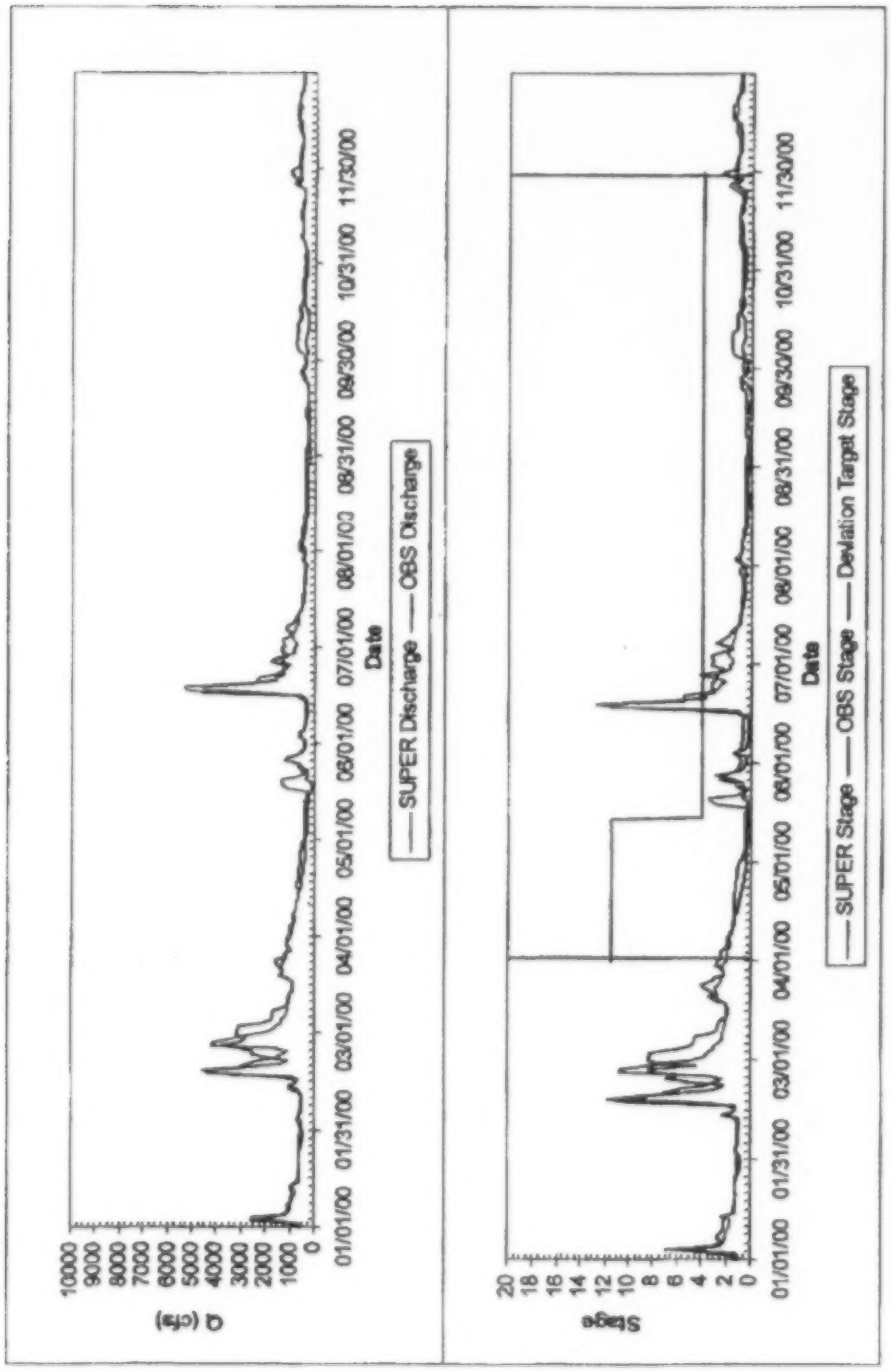

Figure 12. Predicted and observed discharge and stage, and deviation target stage, Black River at Poplar Bluff for 2000.

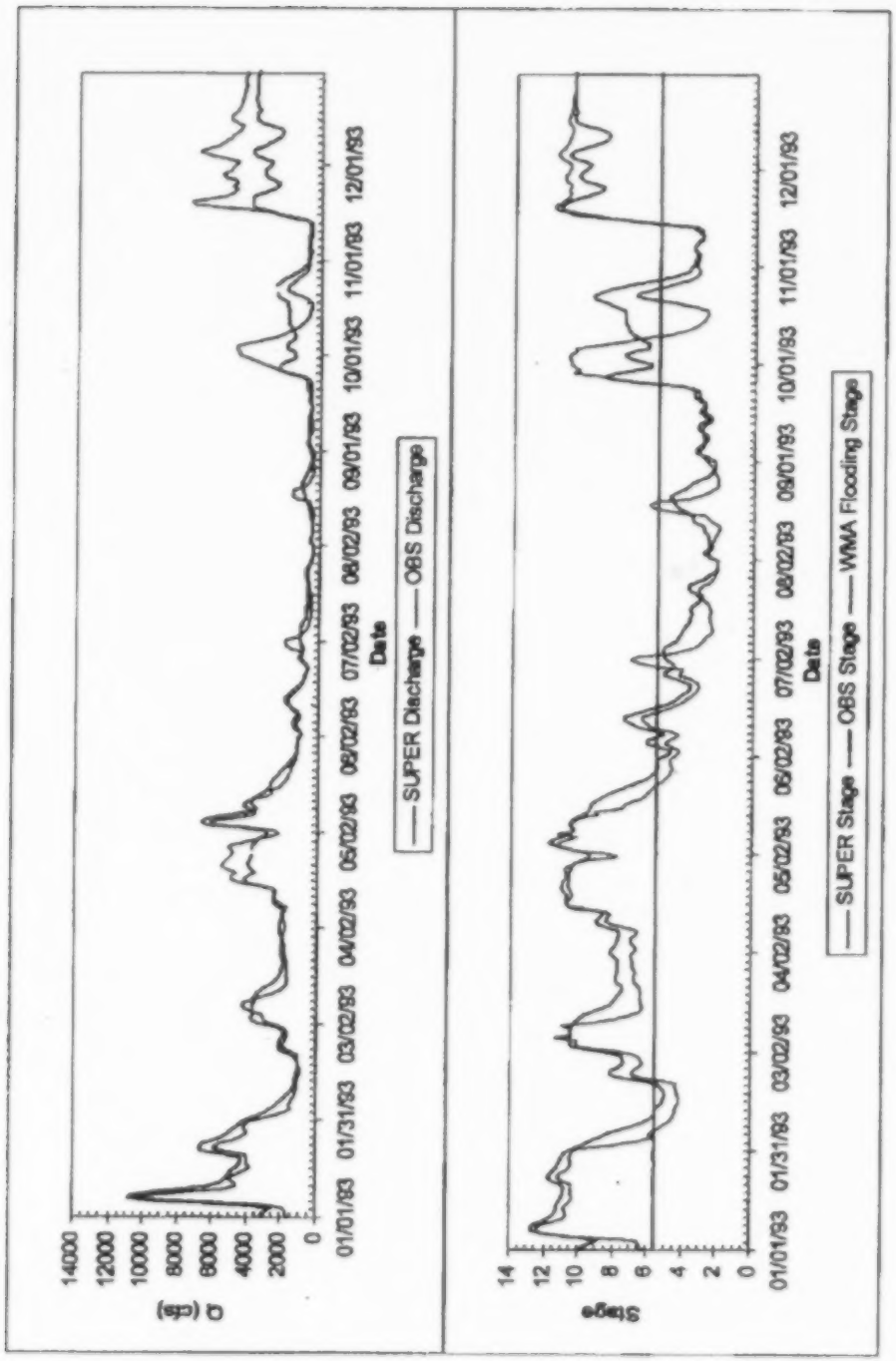

Figure 13. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 1993.

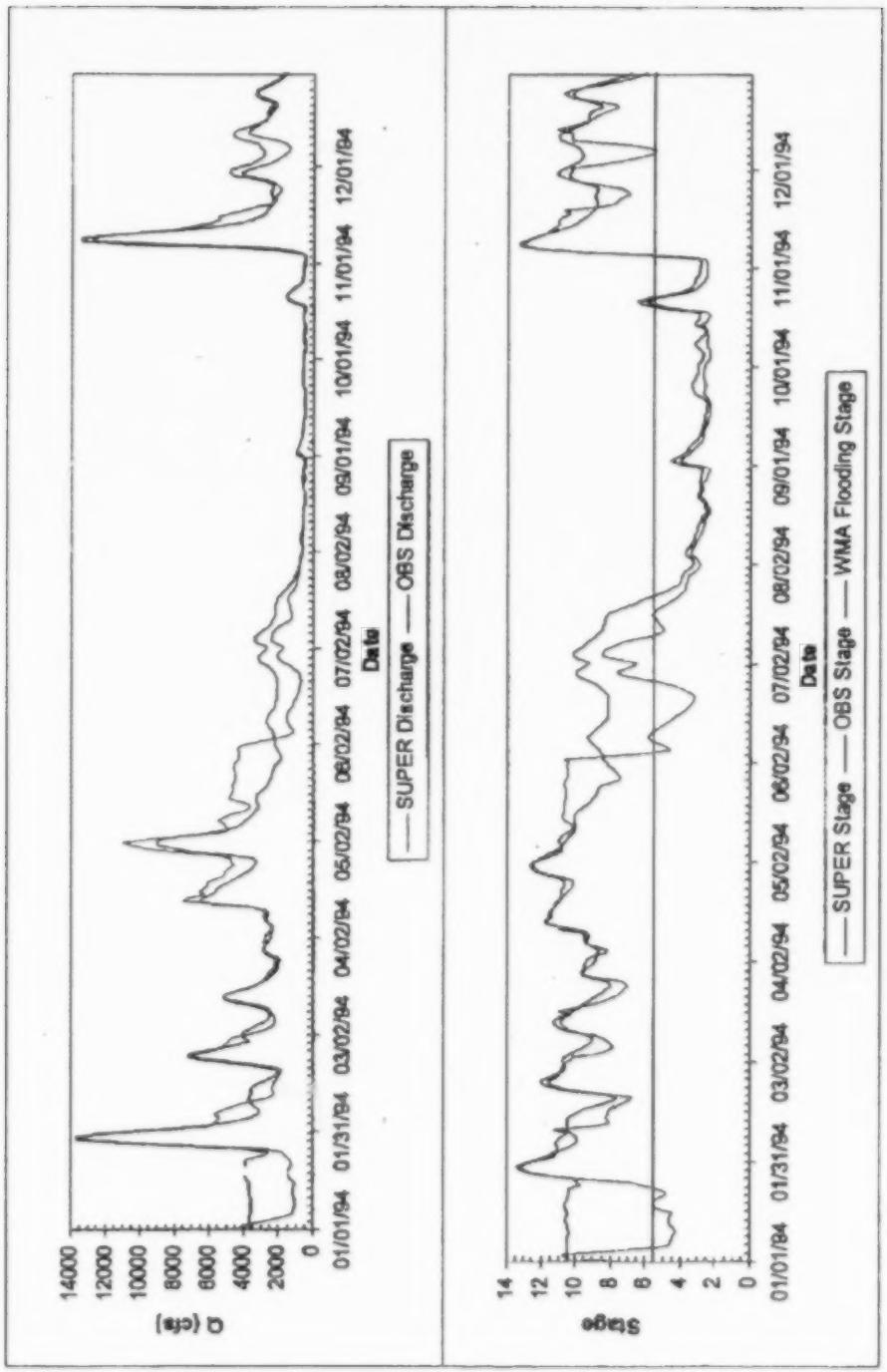

Figure 14. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 1994.

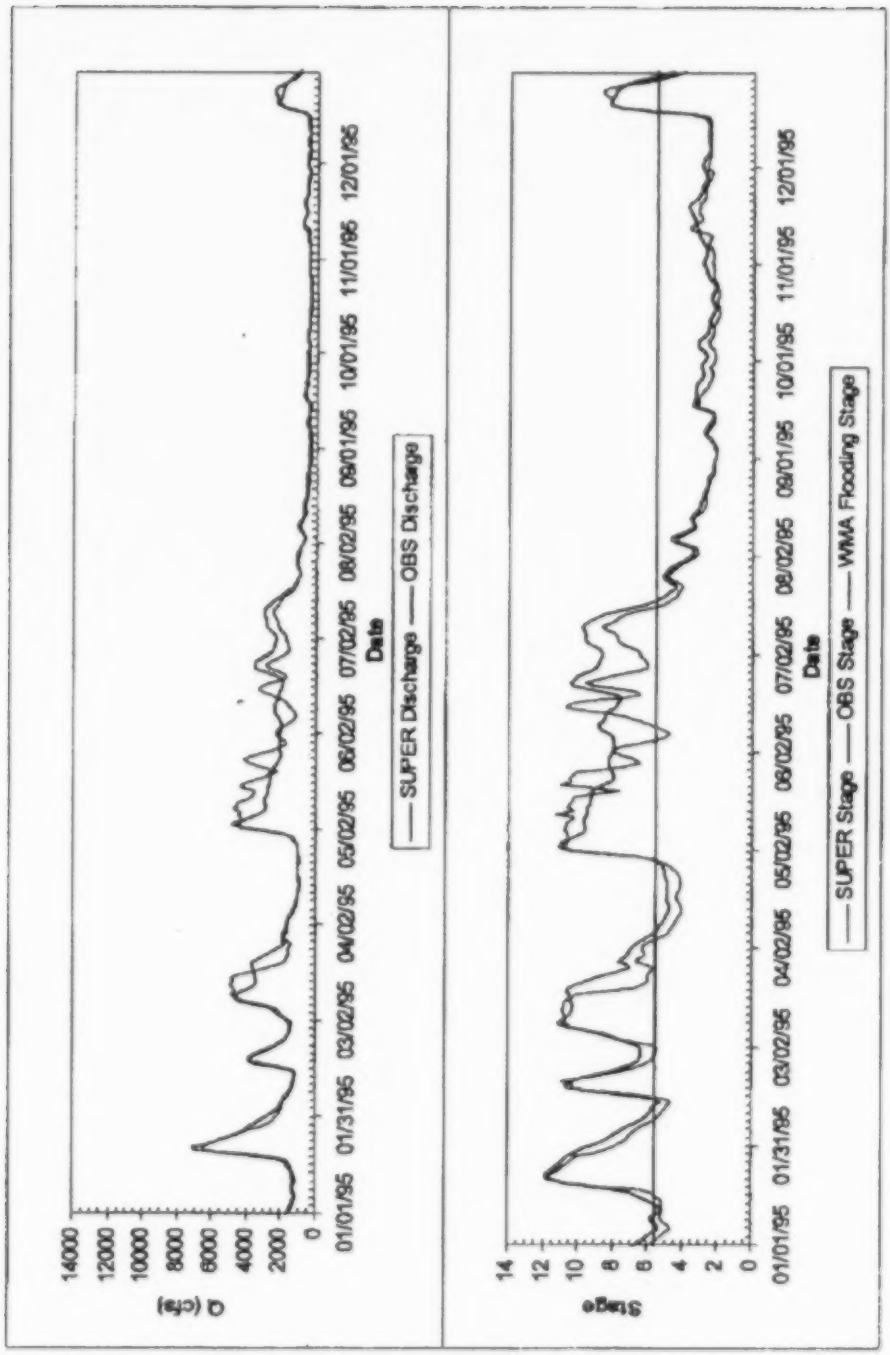

Figure 15. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 1995.

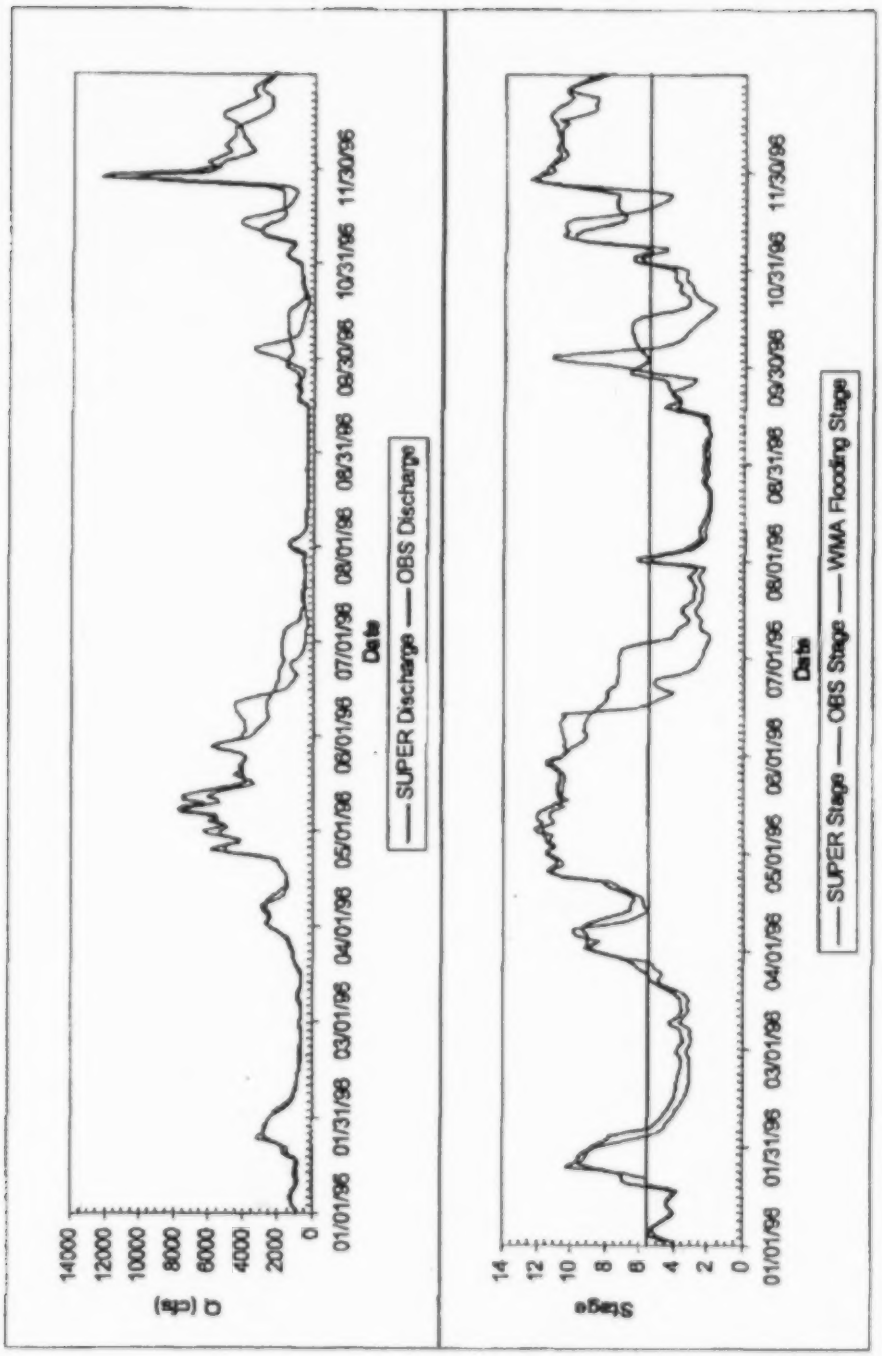

Figure 16. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 1996.

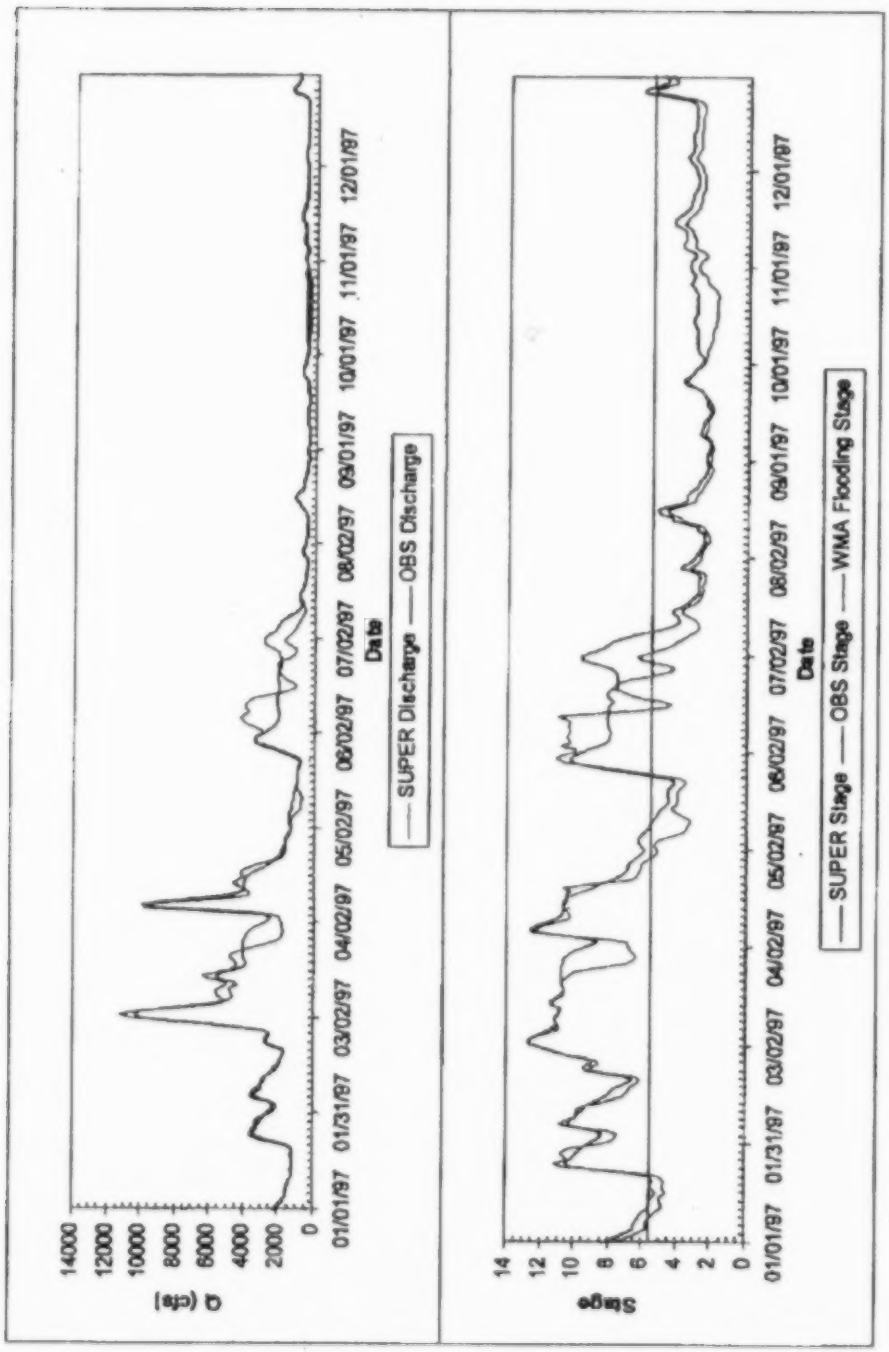

Figure 17. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 1997.

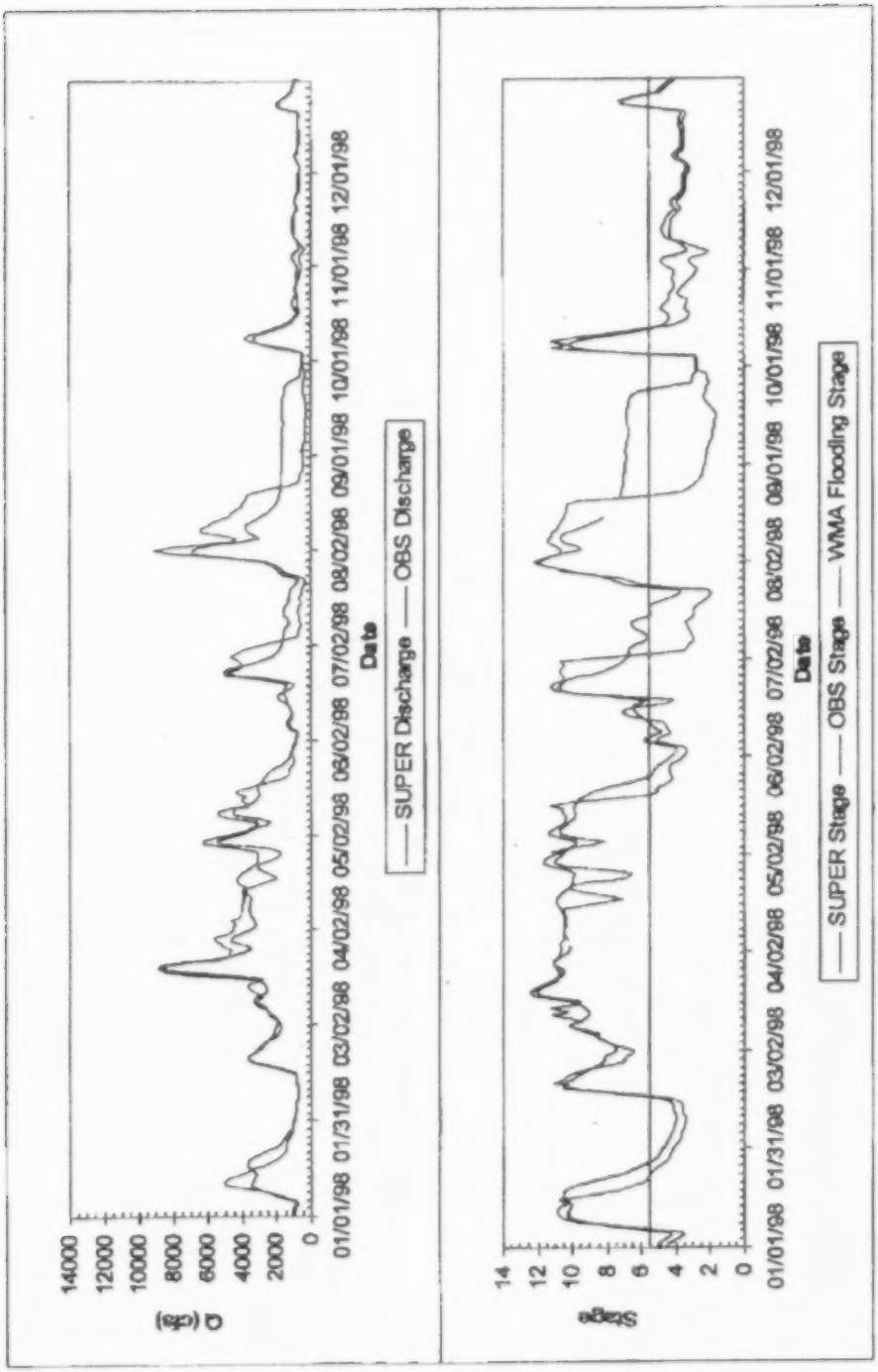

Figure 18. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Coming for 1998.

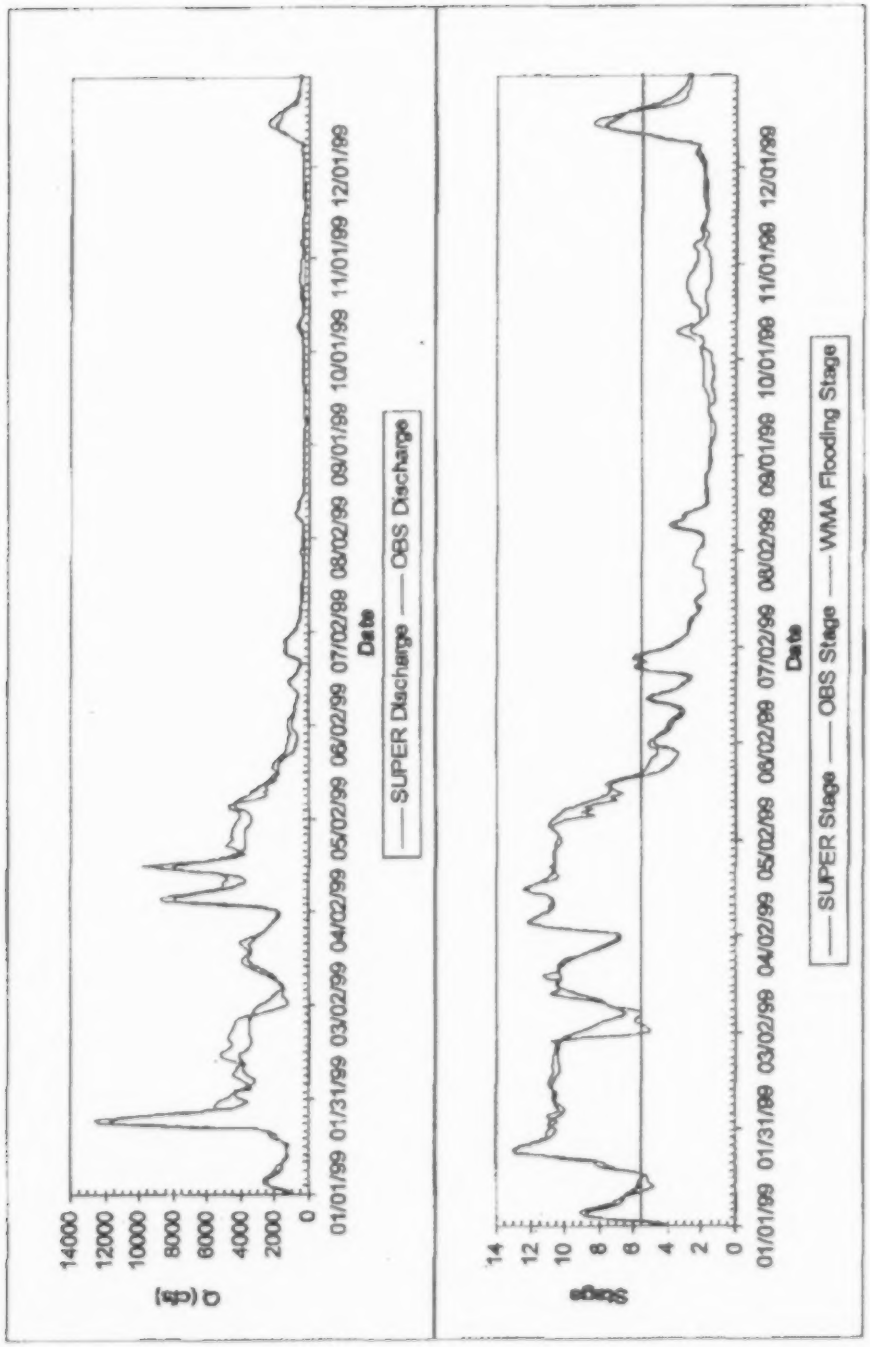

Figure 19. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 1999.

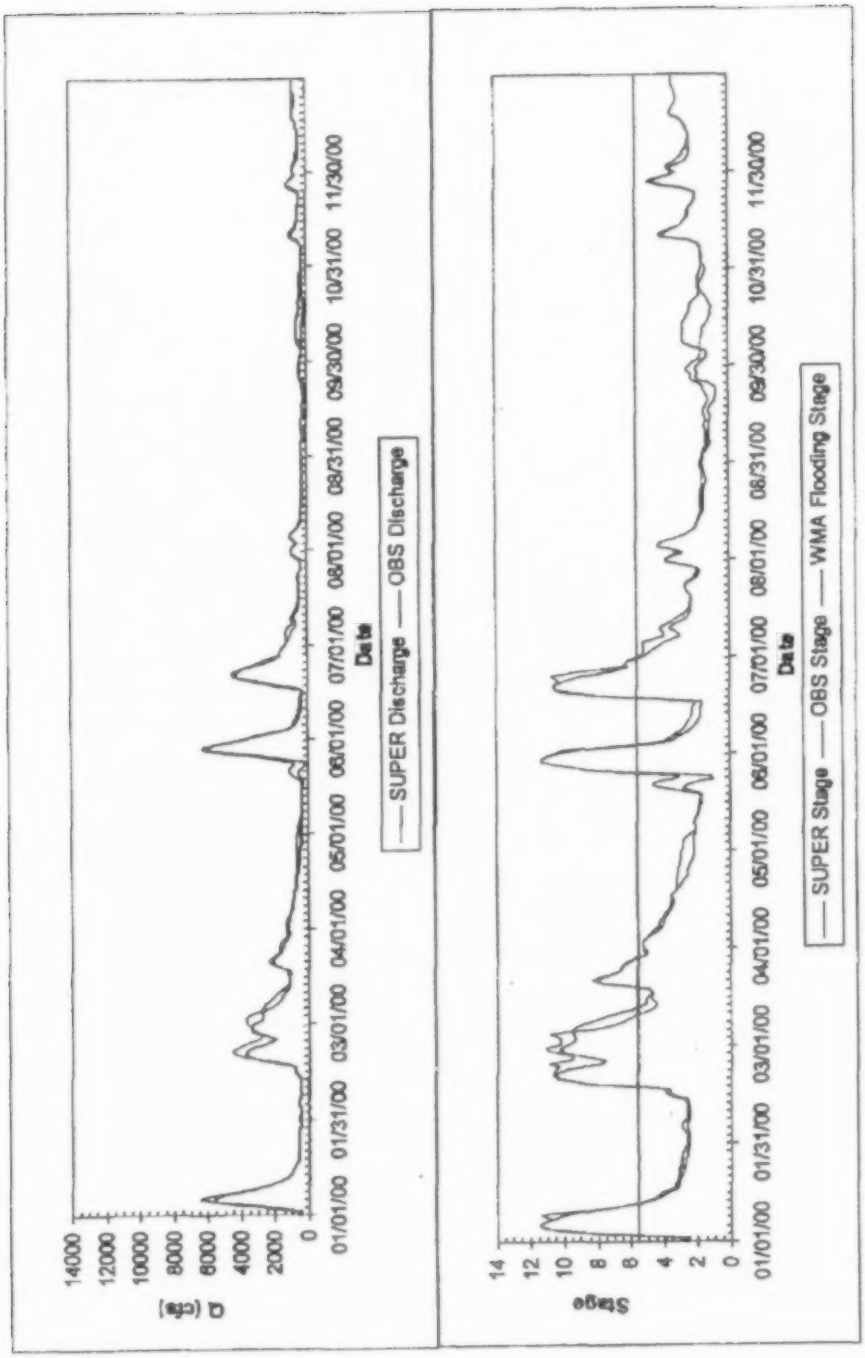

Figure 20. Predicted and observed discharge and stage, and WMA flooding stage, Black River at Corning for 2000.

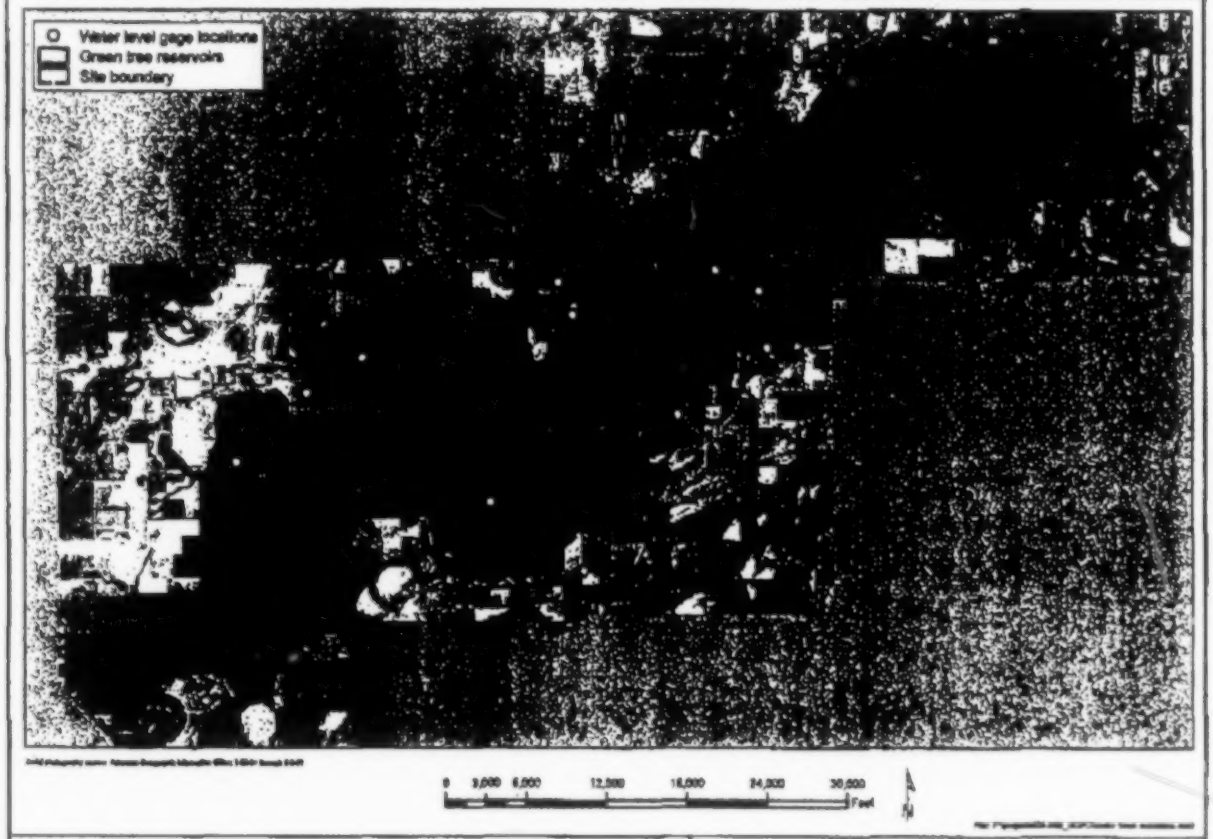

Figure 21. Locations of the water level gages installed on WMA November 2006 through September 2007.

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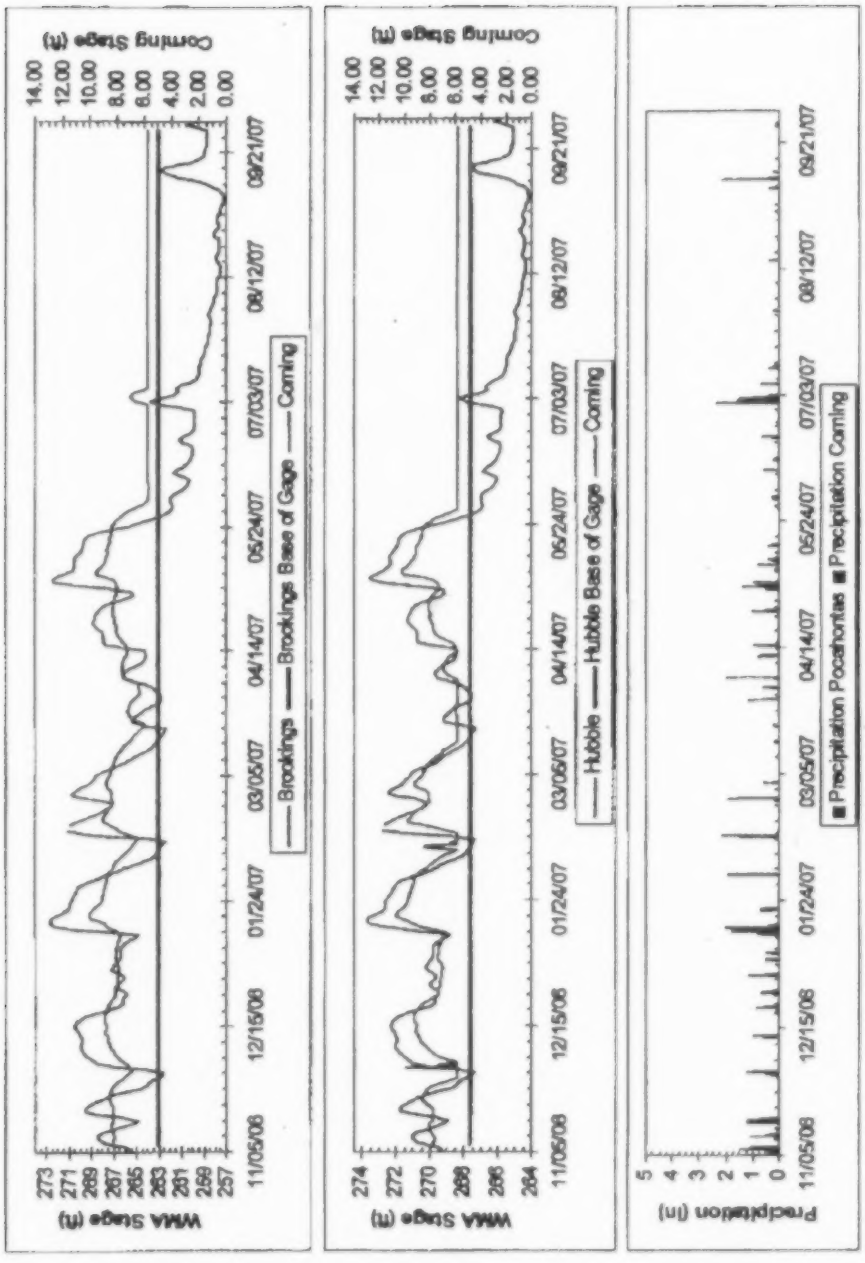

Figure 22. Water levels in the WMA at Brookings, Hubble, and the Coming USGS gage for the period November 2006 through September 2007, and daily rainfall for Pocahontas, AR and Coming, AR.

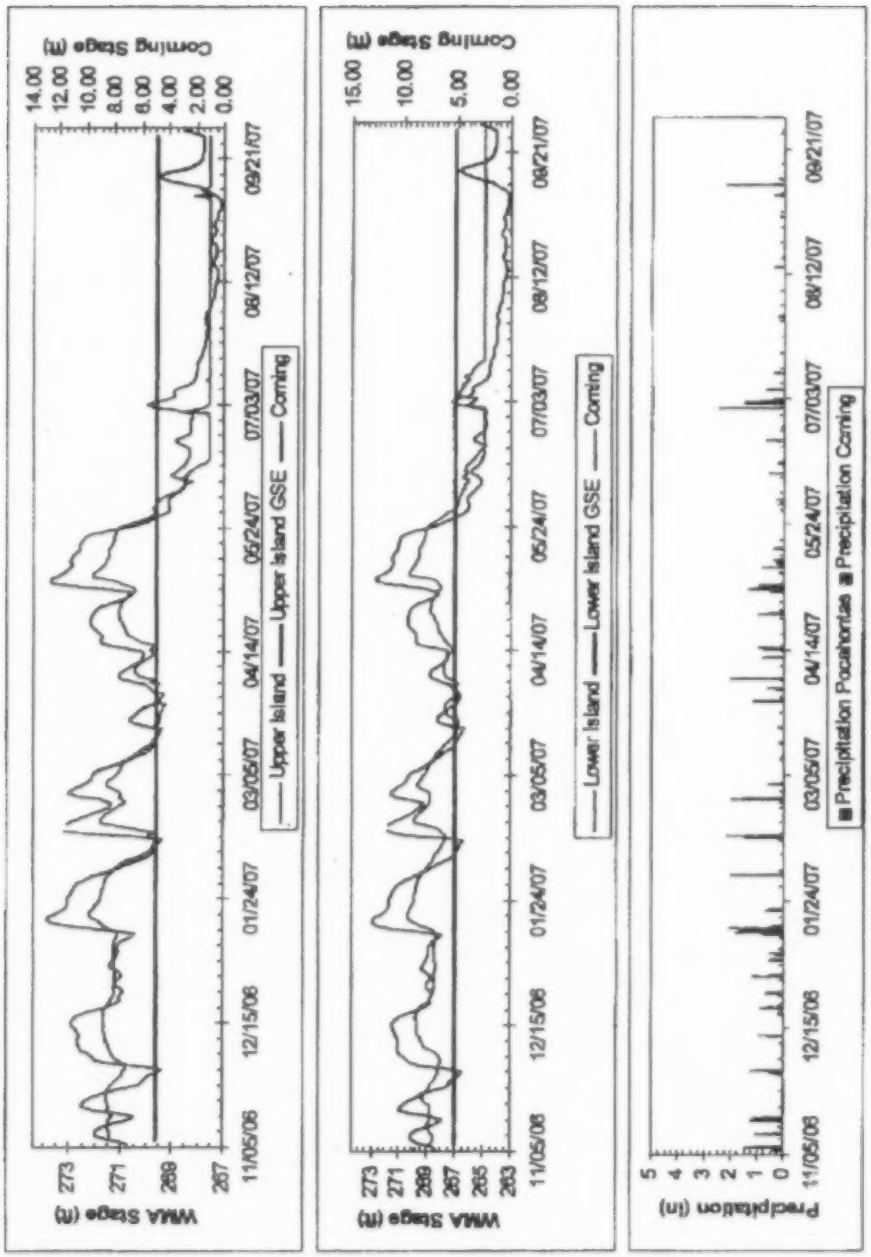

Figure 23. Water levels in the WMA at Upper Island GTR, Lower Island GTR, and the Coming USGS gage for the period November 2006 through September 2007, and daily rainfall for Pocahontas, AR and Coming, AR.

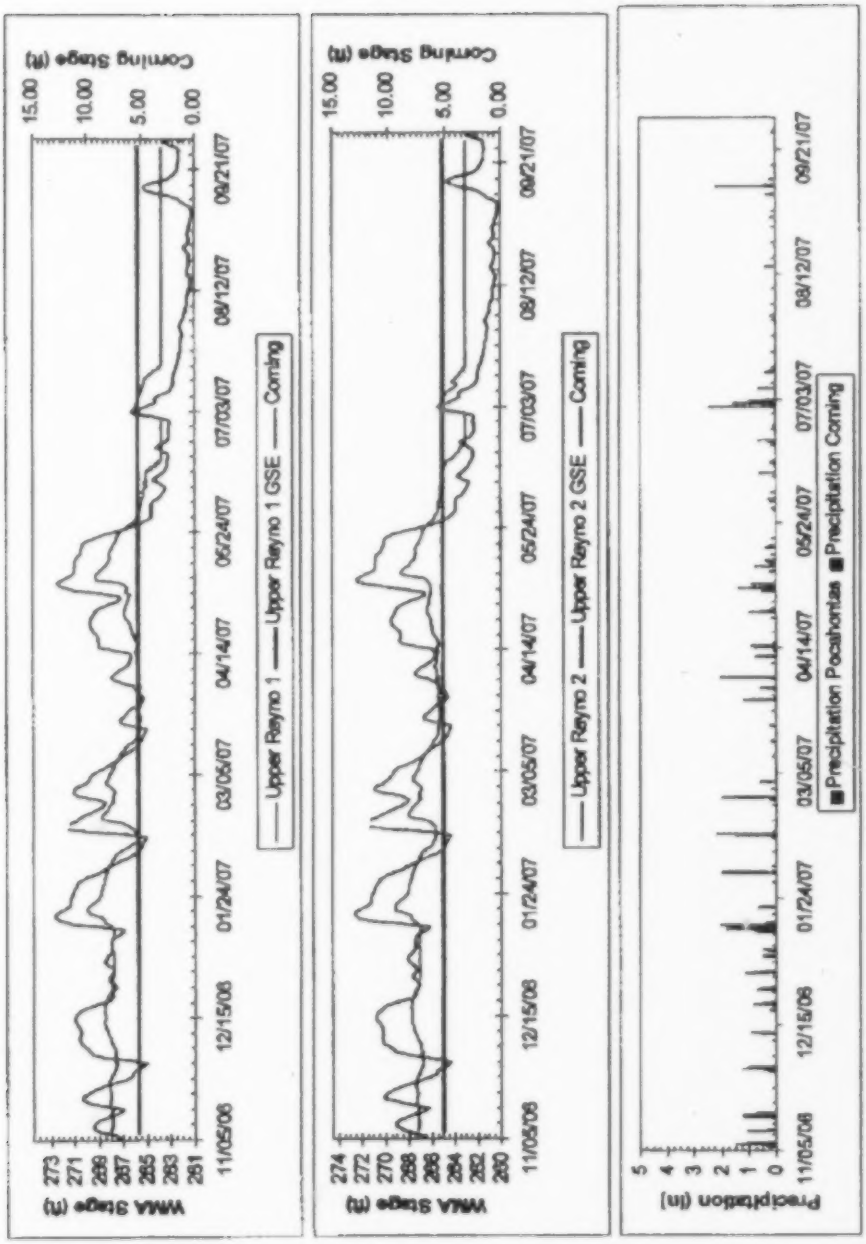

Figure 24. Water levels in the WMA at Upper Reyno (1) GTR, Upper Reyno (2) GTR, and the Coming USGS gage for the period November 2006 through September 2007, and daily rainfall for Pocahontas, AR and Coming, AR.

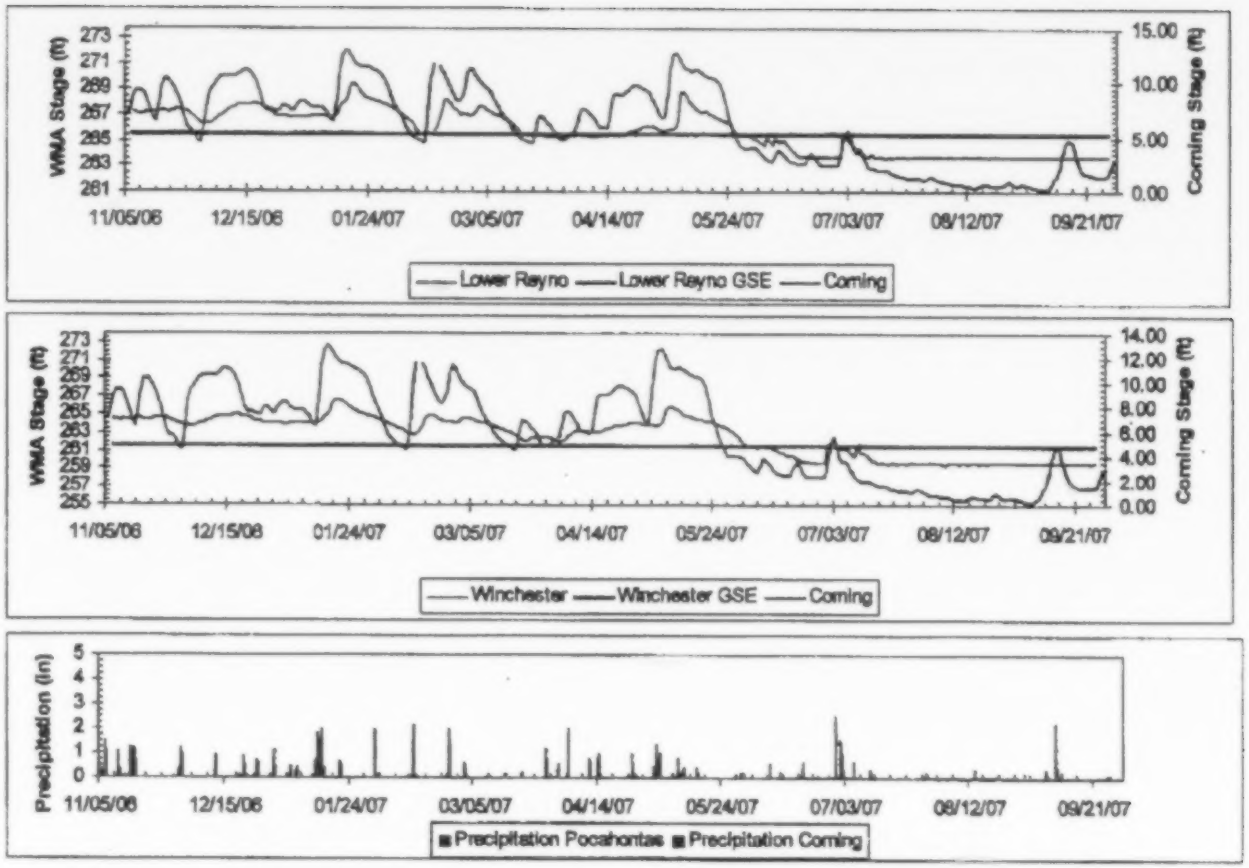

Figure 25. Water levels in the WMA at Lower Reyno GTR, Winchester GTR, and the Corning USGS gage for the period November 2006 through September 2007, and daily rainfall for Pocahontas, AR and Corning, AR.

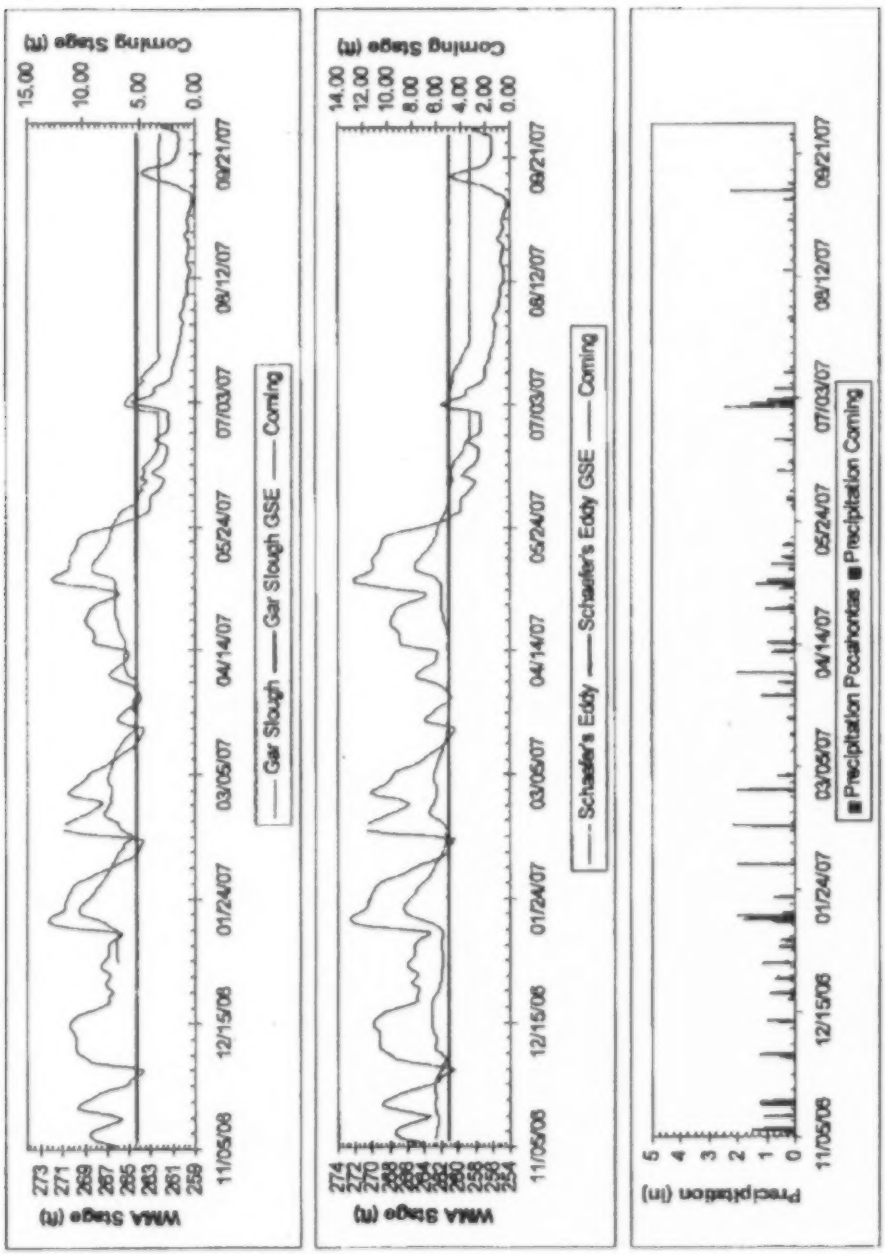

Figure 26. Water levels in the WMA at Gar Slough, Schaefer's Eddy, and the Corning USGS gage for the period November 2006 through September 2007, and daily rainfall for Pocahontas, AR and Corning, AR.

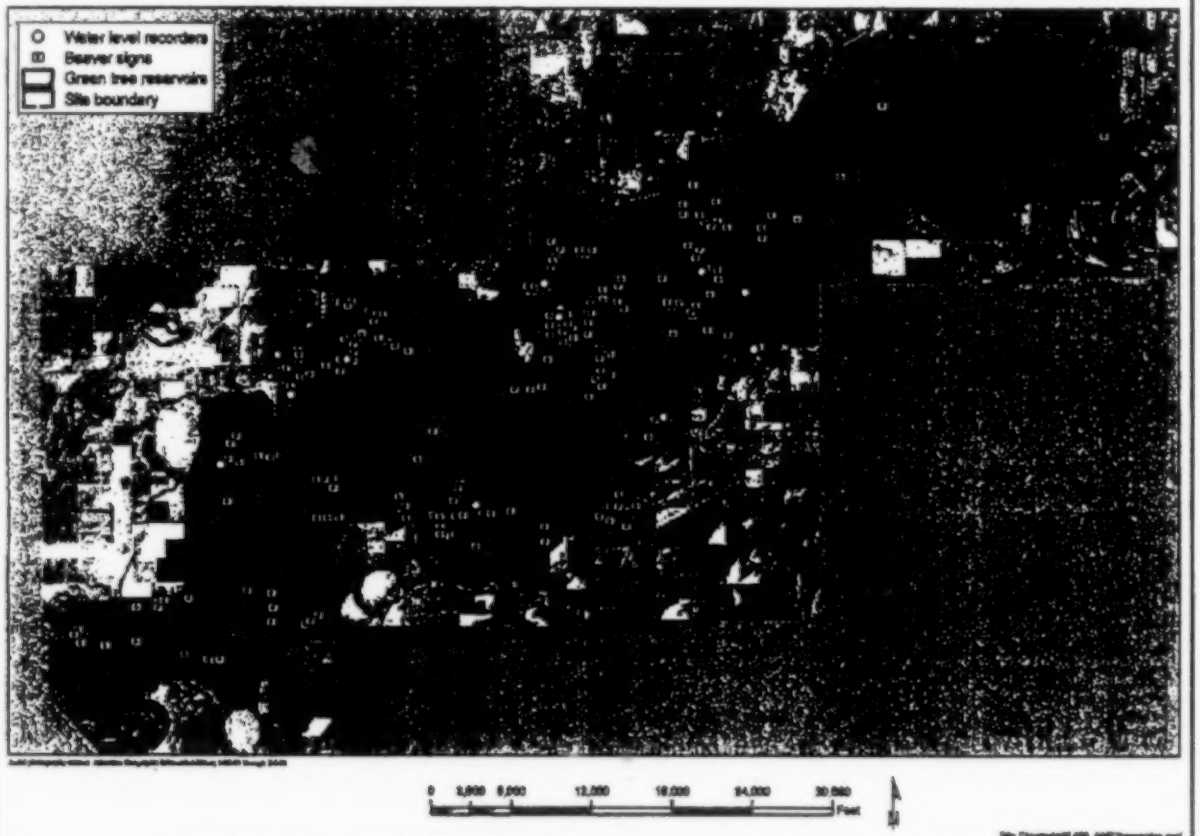

Figure 27. Locations of beaver activity identified by AG & FC contractor Nuisance Animal Control, Inc. beginning in 2000 through 2005.

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APPENDIX A

Southwestern Division Reservoir Regulation Simulation Computer Model Description (SUPER)

SOUTHWESTERN DIVISION RESERVOIR REGULATION SIMULATION COMPUTER MODEL DESCRIPTION (SUPER)

1.0 General. The Southwestern Division Reservoir Regulation Computer Model (commonly referred to as "SUPER") is a tool for evaluating the impacts, both hydrologic and economic, of a given regulation plan for a multipurpose system of reservoirs. The following brief description pertains only to the features associated with the hydrologic aspects of simulated flood control operations. The following topics are covered:

- Hydrologic Input Data,
- Reservoir System and Regulation Plan Description Data,
- Simulation of Streamflow Forecast,
- Mandatory Flood Release Schedule,
- Regulation Targets and Available Channel Space Determination,
- Forecast Reservoir Levels and Target Balance Levels, and
- Flood Control Release Schedule Development.

2.0 Hydrologic Input Data. The "SUPER" computer model is a period of record simulation model using a routing interval of one day. The hydrologic

input to the model, for every reservoir and stream control point, is the period of record uncontrolled area flow. That is, at any of these controls, the input hydrograph constitutes all flow which is attributable to the drainage above that point but below the first upstream reservoir on the tributaries that contribute to that point. The development of these uncontrolled data hydrographs is based on computations that utilize all available pertinent daily records and multi-reach storage vs. discharge (Puls) stream routing relationships. The hydrologic input data is an estimate of the period of record hydrographs that would result if all reservoirs in the modeled area were of infinite storage capacity and no releases were ever made.

3.0 Reservoir System and Regulation Plan Description Data. The basic input data required to describe the reservoirs includes area-capacity curves, maximum discharge curves, and minimum (induced surcharge) discharge curves. In addition, the relationship of the reservoirs to one another is defined by a seasonal function of storage vs. level for each reservoir. The purpose for these is to provide operational priority to achieve balance among the reservoirs. Two reservoirs are considered in balance when they are at the same level as determined from their respective storage-level functions and contents. The relationship of each reservoir control point to other reservoir and stream control points is provided by a set of Muskingum stream routing coefficients for each control point below the reservoir. This provides the way for determined releases to be routed downstream from each reservoir to be added to the input uncontrolled area hydrographs to produce the regulated hydrograph at the downstream control points. The regulating discharge criteria are supplied

for all stream control points (including reservoir outflow controls) as a seasonal function of a system state parameter. The parameter can be null, the current level or the forecast level of a particular reservoir, or the percent of flood storage forecast to be used in a specified group of reservoirs.

4.0 Simulation of Streamflow Forecast. The "SUPER" model iterates sequentially through each day of the period of record determining releases that adhere to the plan to flood control regulation, taking into account hydrologic conditions on each particular day. In order to achieve realism in the flood release schedules each day, it is necessary to simulate a forecast of the flows expected as reservoir inflow and at the stream control points. The objective is for the simulated forecast to be reasonably equivalent to a "real time forecast" based on the rainfall and stream flow data that would be available at that time. The forecast is simulated at each model control point by use of an input specified number of days, beginning with the current day, in which flows are known perfectly. Beyond the span of perfect knowledge, future flows are estimated by use of the input normal recession factors for each individual control point.

5.0 Mandatory Flood Release Schedule. The mandatory flood release schedule is the first major determination made each day of the period of record. These releases are forced releases made only from the flood pool and surcharge pool because the flood pool would be exceeded during the forecast period. The procedure is to determine a release schedule that begins immediately and will minimize the maximum outflow rate and will stay within the restraints provided by the minimum discharge curve and the

maximum discharge curve. This schedule is computed for the forecast period beginning with upstream reservoirs. The mandatory release schedule for a reservoir, once determined, is routed downstream from that reservoir and added to the inflow forecast of the first reservoir downstream of it. In this manner, mandatory flood releases from upstream reservoirs are taken into account when the downstream reservoir's mandatory release schedule is computed. In addition, mandatory releases are routed and added to the forecast hydrographs at all control points between the reservoir and its nearest downstream reservoir.

6.0 Regulation Targets and Available Channel Space Determination. Subsequent to the development and routing of the mandatory release schedule, the flood regulation target flow is determined for each day of the forecast period based on the input regulating discharge function, the current date, and the appropriate parameter for each control point. Once this is accomplished, the space available, by day through the forecast period for flood releases, is determined for each control point by subtracting the forecast flow from the regulating discharge target.

7.0 Forecast Reservoir Levels and Target Balance Levels. The next major step performed by the model is to determine the maximum level each reservoir would reach during the forecast and scheduling period if no flood releases in addition to the mandatory releases were made. Once this is done, all reservoirs are arranged in order by maximum forecast level. Several stream flow control points were designated in the input as "key" control points and the reservoirs that are subject to each of these "key" control points were identified. A target balance level is

then determined for each "key" control point where the forecast storage in the identified reservoirs that are above the target balance level equals the release volume that can be moved through the available channel space at the "key" control point over the forecast and release scheduling period. The target balance levels for all of the "key" control points are then arranged in order by level to form the basis for a series of iterations through the entire system of reservoirs. During each of these iterations, all of the reservoirs which are forecast to be above that level are considered in the development of the flood control release schedules.

8.0 Flood Control Release Schedule Development. A series of iterations are performed in which the flood control release schedules for the system of reservoirs are incrementally increased. There is one iteration for each of the target balance levels determined for the "key" control points considered in descending order of magnitude by level. On a particular iteration, only those reservoirs that were forecast to be higher than the corresponding target balance level are considered, and on any iteration the maximum volume of flood water that is subject to scheduling is limited to the volume of water above the highest target balance level which is associated with any "key" control point to which it is subject. For each reservoir, in turn, during a particular iteration, all of the control points and reservoirs below that reservoir are evaluated to develop a schedule which releases the flood water at the earliest possible time but is subject to the constraints listed below.

(a) The first flood release (current day) cannot exceed the previous day release plus the allowable rising release change rate.

(b) The adjacent day's release schedule cannot vary by more than a prescribed amount.

(c) As the flood pool nears empty, the release schedule must decrease each day at a rate no greater than the maximum allowable falling release change rate.

(d) The routed releases must not exceed the available space at non-"key" control points giving consideration to space that already has been reserved for another reservoir's release schedule. For "key" control points, only a share of the space can be considered for use by the current reservoir based on its reservation established during development of the target balance level associated with that control point.

(e) Space is available for storage in downstream tandem reservoirs above each reservoir's forecast maximum level but below the target balance level unless it has already been reserved for another reservoir's release schedule. The available storage space in the downstream reservoir is used to reduce the release schedule that is evaluated at control points below the downstream reservoir.

As the procedure scans each of the downstream control points, it continues to either reduce the schedule to fit the available space or to leave the schedule as

determined to be the allowable at upstream controls until a final schedule is achieved that is within all constraints.

WADE L. NUTTER, Ph.D., P.H. 2008
Hydrologist and Senior Scientist
President, Nutter & Associates, Inc., 360 Hawthorne Lane, Athens, GA 30606

EDUCATION:

B.S. Pennsylvania State University, 1960; Forest Science
M.S. Pennsylvania State University, 1964; Forest Hydrology
Ph.D. Michigan State University, 1968; Hydrology and Soils

PROFESSIONAL REGISTRATION:

Professional Hydrologist, American Institute of Hydrology No. 394

PROFESSIONAL AFFILIATIONS:

American Water Resources Association
Soil Science Society of America
Water Environment Federation
American Geophysical Union
American Institute of Hydrology

PROFESSIONAL EXPERIENCE:

Dr. Nutter has over 40 years experience in assessment of water resources projects related to land management activities and is University of Georgia Professor Emeritus of Hydrology and Soils

and currently President of Nutter & Associates, Inc. Experience includes research, assessment and development of solutions for soil, water and waste management problems, preparation and supervision of environmental assessments and impact statements, assessment and remediation of contaminated groundwater; stormwater and sediment impacts to water quality, vegetation management, wetland assessment, and surface water hydrology. Dr. Nutter has taught courses in conjunction with the U.S. EPA and Army Corps of Engineers on wetland delineation and functional assessment and watershed hydrology and many other short courses on forest vegetation management and assessment, water resources management, stream restoration, hydrologic evaluations, and erosion and sediment control. He is the author of many articles on impacts of hydrologic modifications, sedimentation, pesticides, wastes and nutrients on water quality and has managed projects in these areas as well as environmental assessment of wetlands, streams, and land management practices. He has served as a consultant to the governments of India and New Zealand and assisted nine states in the U.S. in the development of regulatory guidance. He served on the Georgia Hazardous Waste Authority; Georgia Environmental Education Council; Georgia Academic Panel on turbidity standards in streams; and Georgia Forestry Best Management Practices guidebook task group; and served as director of a U.S. AID project on Watershed Management in Sri Lanka. He also was a member of the Corps of Engineers task group to develop procedures for the hydrogeomorphic functional assessment of

wetlands and co-authored guidebooks for riverine and other wetland systems.

PUBLICATIONS IN LAST FOUR YEARS

Nutter, W.L. and Morris, L.A, 2004, Waste Treatment and Recycling. Soil Development and Properties Encyclopedia of Forest Sciences

RECENT PROJECT EXPERIENCE:

Wetland Restoration, Aquarius Development, San Juan, Puerto Rico (Project Scientist and Manager)

2000 - present: Assessed unauthorized fill of mangrove wetlands, developed USACOE approved mitigation plan, supervised removal of over 64,000 yd^3 of fill, implemented planting of three species of mangrove, maintained monthly monitoring program.

Discharge of Effluent to Natural Forested Wetlands, International Paper and Emerald Coast Utilities Authority, Florida (Project Scientist and Manager)

2000 - present: Conduct field studies, direct design, and manage team of scientists for design, permitting, and monitoring of a 1,500-acre wetland system to receive discharge of 28.5 MGD of paper mill and domestic effluent; prepare NPDES and FLDEP and USACOE wetland permit applications; testify at hearing challenging NPDES permit.

Reintroduction of Ouachita River Flow to Historic Wetlands, The Nature Conservancy, Louisiana (Project Scientist and Manager)

2008 - present: Conduct studies to determine approaches and impacts of breaching and eventual removal of 17 miles of levee to reintroduce river overbank flow into 20,000 acres of drained wetlands and streams modified for agricultural production; develop strategy for restoration of wetlands and stream channels.

SUMMARY OF PROJECTS REQUIRING EXPERT TESTIMONY/EVALUATION SINCE 2004

Wade L. Nutter, Ph.D., P.H. — *Nutter & Associates, Inc.*

April 2008

Year Completed	Client	Description	Court	Expert Report	Deposed	Qualified Court Expert	Outcome/ Settlement
2005	U.S. EPA and U.S. DOJ (Plaintiff) v Adams Bros. Farming	Evaluation of hydrologic conditions related to wetland regulation violations	Federal District Court, Central District of California	✓	✓		Trial February 2005; settled at start of trial
2004	City of Cairo (Plaintiff) (Troutman Sanders)	Municipal Land Application System failure	State Superior Court, Gwinnett County, GA	✓	✓	✓	Jury trial; judgement awarded in favor of Plaintiff

Year Completed	Client	Description	Court	Expert Report	Deposed	Qualified Court Expert	Outcome/ Settlement
2005	U.S. Army Corps of Engineers, U.S. EPA (Defendant) (U.S. DOJ)	U.S. sued for taking in wetland violation case	Federal District Court, Orlando, FL			✓	Settled during trial
2006	Dominion Peoples Gas Co.(Defendant) (McGuire Woods)	Ground water and surface water flooding damage to building	Federal District Court, Pittsburgh, PA	✓			Not called to testify, this portion of trial dismissed

Year Completed	Client	Description	Court	Expert Report	Deposed	Qualified Court Expert	Outcome/ Settlement
2006	BioLab (Defendant) (Troutman Sanders)	Alleged damage to trees from gas emitted from chemical fire	Superior Court, Georgia				Settled
In Progress	Friends of Perdido Bay (FL) v. Florida Dept of Environmental Protection and International Paper	Challenge of NPDES permit for discharge to wetlands	Florida Dept of Administrative Services - Administrative Law Judge	✓		✓	Judge requested changes to permit application; new hearing scheduled

Year Completed	Client	Description	Court	Expert Report	Deposed	Qualified Court Expert	Outcome/ Settlement
In Progress	H. Roberts Family LLC (Defendant) (Stites & Harbiston PLLC)	Sediment deposition caused by subdivision construction	Superior Court, Georgia				Evaluation in progress
In Progress	McBride & Sons Homes (Defendant) (Stites & Harbiston PLLC)	Sediment deposition caused by subdivision construction	Superior Court, Georgia				Evaluation in progress

Year Completed	Client	Description	Court	Expert Report	Deposed	Qualified Court Expert	Outcome/ Settlement
2007	TEMCO (Defendant) (Troutman Sanders LLP)	Sediment deposition caused by subdivision construction (EPA Consent Order)	Federal District Court, Atlanta GA				Settled
2006	Various Forest Industries (Huddleston Bowen LLP)	Alleged damage to flooding caused by forest harvesting (Class Action)	Raleigh County West Virginia				Jury decision in favor of Plaintiffs overturned by Judge

JOINT EXHIBIT 6

Clearwater Lake
Water Control Plan

Final
ENVIRONMENTAL ASSESSMENT

February 2000

Prepared for:
U.S. ARMY CORPS OF ENGINEERS
LITTLE ROCK DISTRICT

Prepared by:
PARSONS ENGINEERING SCIENCE, INC.

1.0 INTRODUCTION

1.1 Scope and Purpose of the Proposed Action

This Environmental Assessment (EA) evaluates impacts from the proposed changes to the authorized U.S. Army Corps of Engineers Clearwater Lake Water Control Plan. The Black River originates in southeastern Missouri and flows generally south into northeastern Arkansas. The Black River is a major tributary in the larger White River watershed.

Proposed Action

The action proposed is a change in the authorized Water Control Plan for Clearwater Lake on the Black River in Missouri. The proposed change would alter the timing and size of water releases from Clearwater Lake. The authorized Water Control Plan for Clearwater Lake calls for releases to be sized and timed such that those releases, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a stage at the Poplar Bluff, Missouri gage of: 11.5 feet during the period from December 1 through March 31; and 10.5 feet during the period April 1 through November 30. However, Clearwater Lake is currently being operated by an approved deviation from the authorized plan that stipulates that releases will be sized and timed such that, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a stage at the Poplar Bluff, Missouri gage of: 11.5 feet from December through mid-May and to 4 feet from mid-May to the end of November. The zero point for measuring river stage is an elevation of 317.48 feet, National Geodetic Vertical Datum (NGVD). The proposed change would link the target river stage to the water level in Clearwater Lake. The control point for regulating releases of water from Clearwater Lake is the Poplar Bluff gage.

The purposes of Clearwater Lake regulation are threefold:

- to reduce flood crests,
- to maintain releases below a level at which cleared land is flooded during the agricultural season, and

- to expedite the evacuation of flood control storage from Clearwater Lake during the non-agricultural season.

History

Various floods occurred in the area in the 1920s and 1930s with the most serious flooding occurring in 1937. In 1938, Congress authorized the construction of six projects in the White River basin, with the Clearwater Lake project on the Black River being authorized for flood control. Construction of the Clearwater Dam began in 1940 and was completed in 1948.

In the early to mid-1970s, areas normally flooded were left dry by climatic deviations (i.e. low flow years). During this time, land which had been regularly flooded, and therefore unsuitable for farming, was now devoted to crops and timber. In the late 1970s, rainfall returned to more typical amounts and the additional land being used for crops and timber was once again flooded.

1.2 Project Location

The Black River originates near the northeast corner of Reynolds County in southeastern Missouri. Clearwater Lake and Dam are located on the Black River in the southeastern portion of Reynolds County. The dam is located at river mile 257.4. The Black River drainage basin occupies 8,520 square miles in 15 counties in southeastern Missouri and northeastern Arkansas. The Black River is a part of the larger White River basin which occupies 27,765 square miles. The Poplar Bluff gage is located at river mile 210.9 of

the Black River. The location of the Black River basin is shown in Figure 1-1.

1.3 Project Authority and Regulatory Requirements

The Clearwater project was authorized for flood control purposes by the Flood Control Act of 1938. This act authorized a comprehensive plan for the White River Basin, consisting of reservoirs on the White River and its tributaries. Clearwater Lake is a man-made reservoir on the Black River, which is a tributary to the White River. Storage in the lake is allocated for flood control and a permanent pool is provided for recreation and wildlife. There is no hydro-power generation at Clearwater Dam. The project has no authorized water supply storage.

LOCATION MAP
CLEARWATER LAKE
MARK TWAIN NATIONAL FOREST
MISSOURI
ARKANSAS
LEGEND
VICINITY MAP

2.0. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVE

2.1 Description of the Proposed Action

The proposed action is a revision to the existing Water Control Plan. The revision would modify the stages on the Black River at Poplar Bluff, Missouri to which flood control releases from Clearwater Dam would be regulated. Additionally, the proposed revision would eliminate a mosquito-control pool manipulation during the summer months by extending the seasonal pool operation, at elevation 498.0, from, May 1 through October 14.

As part of the proposed action, the USACE would regulate releases from Clearwater Dam to a river stage of 11.5 feet at Poplar Bluff from December until mid-May. From mid-May through November the regulating stage at Poplar Bluff would depend on the lake level elevation.

- If the lake elevation is less than 520 feet NGVD, the target river stage at Poplar Bluff would be regulated to 4 feet.
- If the lake elevation is between 520 feet and 528 feet, the target river stage would be regulated to 6 feet.
- If the lake elevation is between 528 feet and 544 feet, the target river stage would be regulated to 8 feet.
- If the lake elevation exceeds 544 feet, the target river stage would be regulated to 10.5 feet.

Figure 2.1, Proposed Poplar Bluff Regulating Stages, is a graphic representation of the proposed regulating stages and associated lake levels.

2.2 No Action Alternative

The No Action Alternative would continue with the currently authorized Water Control Plan. Figure 2.2 provides a graphic representation of the present Clearwater Lake Water Control Plan river stages.

Figure 2.1 Proposed Poplar Bluff Regulating Stages

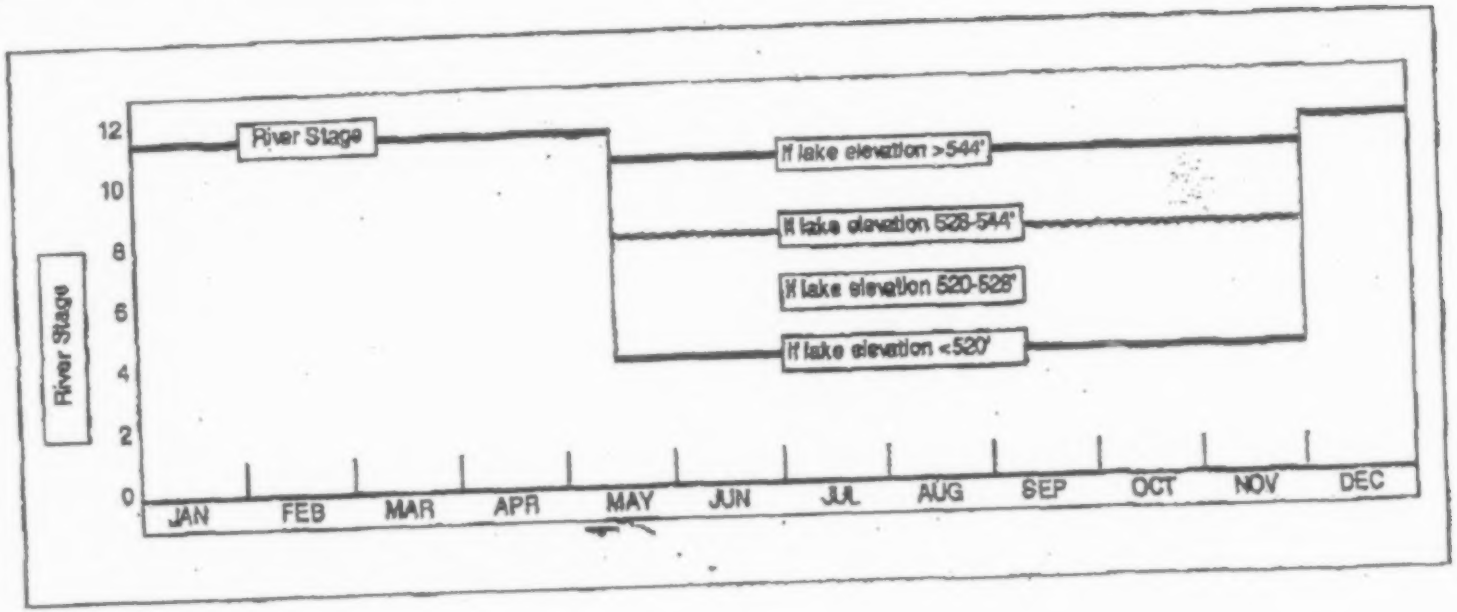
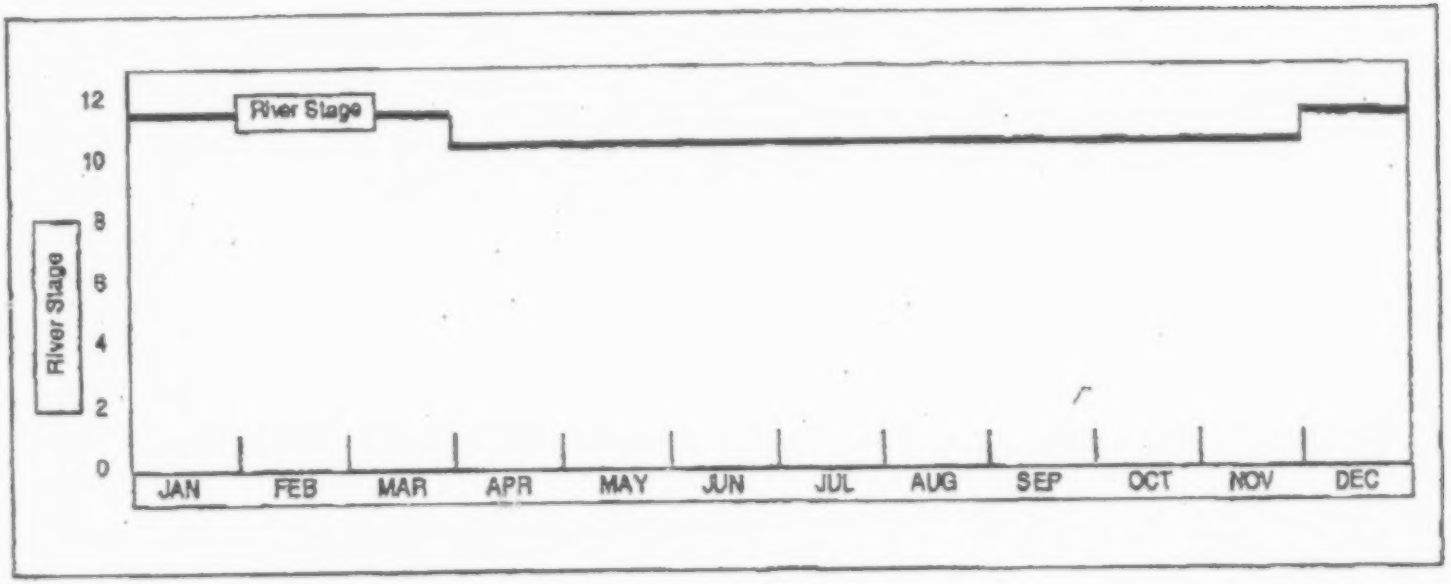


Figure 2.2 Currently Authorized Poplar Bluff Regulating Stages



3.0 EXISTING CONDITIONS

3.1 Land Use

3.1.1 Agricultural Crops

For analysis purposes, the Black River is divided into two reaches between Clearwater Dam and the Missouri/Arkansas state line. Reach 1 covers the area from the dam to Poplar Bluff; Reach 2 covers the area from Poplar Bluff to the state line. The crops occupying the most acreage in Reaches 1 and 2 are soybeans, double-cropped wheat with soybeans, and sorghum. Soybeans and double-cropped wheat with soybeans are the most valuable crops in the two reaches. Table 1 summarizes information about the major crops grown in Reaches 1 and 2.

Table 1. Acreage and Annual Value of Crops between the Clearwater Dam and the Missouri/Arkansas State Line on the Black River

Crop	Acreage	Value($)
Soybeans	23,400	4,422,600
Double Crop	12,960	4,140,720
Sorghum	12,960	2,157,840
Rice	12,000	3,359,400
Corn	3,480	1,112,904
Improved Pasture	2,880	424,800
Unimproved Pasture	1,920	176,640
TOTAL	**69,600**	**15,794,904**

Source: Clearwater Lake, Black River, Missouri, Water Control Manual. Little Rock District, Corps of Engineers.

Approximately one-half of the estimated flood losses in the Black River watershed occur between Clearwater Dam and the Missouri/Arkansas state line, with the remaining losses occurring downstream of the state line. A major portion of the direct flood losses is from damage to crops. Crop losses are highly seasonal, with a relatively small amount in the winter to complete crop loss just prior to harvest in the late summer and fall. Table 2 shows the damages prevented by the reservoir in the 10-year period 1982-1992.

Table 2. Damages Prevented by Clearwater Project Reservoir

Fiscal Year	Damages Prevented ($1,000s)
1982	5,240
1983	15,831
1984	2,268
1985	16,046
1986	10,258
1987	0
1988	1,241
1989	1,780
1990	1,884
1991	2,870
1992	2,775
Total	**61,193**

Source: Little Rock District, U.S. Army Corps of Engineers

Prime farmland is land that has the best combination of physical and chemical characteristics for producing

food, feed, forage, fiber, and oilseed crops and is also available for these uses. Table 3 provides a list of the soils along the Black River which are considered prime farmland. The soil associations are discussed in section 3.2.2. Because the influence of Clearwater Dam is diminished by the time the Black River reaches the Missouri/Arkansas state line, only Missouri soils are listed in the table.

Table 3. Soils Occurring Along the Black River which are Considered Prime Farmland

Soil Name	Condition Necessary to be Considered Prime Farmland (if any)
Amagon silt loam	where drained
Calhoun silt loam	where drained
Captina silt loam	2 to 5 percent slopes
Tuckerman/Bosket fine sandy loams	0 to 5 percent slopes, where Tuckerman part is drained
Tuckerman fine sandy loam	where drained

Source: Soil Survey of Butler County and Part of Ripley County Missouri. United States Department of Agriculture, Soil Conservation Service. November, 1983.

3.1.2 Timber

In the uplands of the Black River watershed, white oak, black oak, southern red oak, blackjack oak, post oak, and scarlet oak are the major forest species. On bottomlands along streams and tributaries, northern red oak, Shumard oak, white oak, shagbark hickory, black cherry, black walnut, sycamore, elm, hackberry,

river birch, and ash are the major species. Tree growth and quality tends to be good along these drainageways (USDA, 1983).

Review of aerial photographs shows that much of the timber in proximity to the Black River is on the river side of man-made levees. These levees border the river approximately between Poplar Bluff, Missouri and the Dave Donaldson Black River Wildlife Management Area in Clay County, Arkansas (USDA, 1983; USDA, 1978).

In Butler and Wayne counties in Missouri there are two logging companies, employing less than 40 people. In Butler and Wayne counties in Missouri and Clay County, Arkansas there are 25 sawmills and planing mills, employing less than 113 people (Census, 1996).

3.1.3 Floodplains

The Black River floodplain beginning at Clearwater Dam and extending to Black Rock, Arkansas encompasses approximately 168,000 acres. The majority of the floodplain is undeveloped, with much of the land in agriculture. The effect of Clearwater Dam diminishes at approximately the Missouri/Arkansas state line. The effect of the the dam diminishes due to the increased size of the watershed the river drains. At the following places, the river drains a watershed of the following size:

- At the Clearwater Dam, the Black River drains 898 square miles;
- At Poplar Bluff, Missouri, the river drains 1,245 square miles;
- At the Missouri/Arkansas state line, the river drains 1,600 square miles;

- At Corning, Arkansas, the river drains 1,749 square miles;
- At Pocahontas, Arkansas, the river drains 4,843 square miles;
- At Black Rock, the river drains 7,369 square miles;
- At its confluence with the White River, near Newport, Arkansas, the river drains 8,520 square miles.

3.2 Climate

The pattern of weather in the region is of moderately cold winters and long, hot summers. In winter, the average temperature is 37 degrees Fahrenheit (F), with the average daily low temperature being 27 degrees F. In the summer, the average temperature is 76 degrees F, with the average daily high temperature being 89 degrees.

Annual precipitation is approximately 48 inches. Heavy rains occur mainly in spring and early in summer. Of the total annual precipitation, approximately 50 percent falls in April through September. The growing season for most crops falls within this period.

3.3 Geology

3.3.1 Topography and Physiography

The headwaters of the Black River are in the Interior Highlands. The Highlands are characterized by plateaus entrenched by steep-walled valleys. Local relief of the surfaces of the upland generally does not exceed 50 feet.

The Black River enters the White River in the Coastal Plain. The Interior Highlands are separated from the Coastal Plain the westernmost boundary of rocks of Cretaceous or younger age. The topography of the Coastal Plain is characterized by flat plains traversed by sluggish meandering streams. The land surface of the Coastal Plain is made up principally of terrace deposits and floodplain deposits of the Mississippi River and its tributaries.

Elevations in the watershed range from 656 feet NGVD at the confluence of the East, Middle and West forks of the Black River to 328 feet NGVD at poplar Bluff to 278 feet at Corning, Arkansas.

3.3.2 Soils

The Clarksville/Captina Association soils occupy broad ridgetops and side slopes. The soils are deep, gently to moderately sloping, some of which have a fragipan, and gently sloping to very steep soils that are cherty throughout. They are moderately well to somewhat excessively drained. These soils were formed in loess over residuum or in a mixture of loess and residuum. These soils occur along the reach of the Black River upstream of Poplar Bluff, Missouri in the northern third of Butler County.

The Calhoun-Amagon Association soils occupy high and low terraces and floodplains of large streams and their tributaries. Slopes are nearly level. They are deep, poorly drained and slowly permeable. These soils formed in silty alluvium. These soils occur along the reach of the Black River downstream of Poplar Bluff, Missouri in the mid one-third of Butler County.

The Tuckerman-Bosket Association soils occupy nearly level terraces and natural levees. They are deep, well drained to poorly drained and somewhat poorly drained silty soils. Permeability is moderate to moderately slow. These soils formed in stratified beds of loamy sediment. These soils occur along the reach of the Black River in the southeast quarter of Butler County.

3.4 Water Resources

3.4.1 Surface Water

Clearwater Dam is located at river mile 257.4 on the Black River and has a drainage area of 898 square miles. In the highland area, the river and its tributaries are characterized by narrow valleys, steep gradients, and comparatively large channel capacities. Tributaries to the Black River include the Current, Spring, Eleven Point, and Strawberry rivers. The lower Black River is in the lowland area and is characterized by a flat slope bed, wide overbanks, and a meandering channel of relatively small capacity.

The Black River bears only a small amount of sediment. The majority of the watershed above Clearwater Lake is mountainous and densely covered in woods, which greatly inhibits erosion.

Table 4 provides storage and elevation data for the Clearwater Lake project.

Table 4. Clearwater Lake Physical Features				
Feature	Elevation[1] (feet)	Area (acres)	Cumulative Capacity (acre feet)	Equivalent Runoff[2] (inches)
Top of Dam	608	18,560	1,013,750	21.17
Top of Flood Control Pool	567	10,400	413,700	8.64
Spillway Crest	567	10,400	413,700	8.64
Top of Summer Seasonal Pool	498	1,870	28,880	
Top of Conservation Pool	494	1,630	21,920	0.46
Inactive Pool	467	75	210	0.004
Flood Control Storage	n/a	n/a	391,780	8.18
Conservation Storage	n/a	n/a	21,920	0.46
[1]Elevations listed are feet NGVD. [2]From the 898 square miles of drainage area upstream of the dam.				
Source: Clearwater Lake, Black River, Missouri, Water Control Manual. Little Rock District, U.S. Army Corps of Engineers, July 1995.				

3.4.2 Ground Water

In the upper reaches of the river, the Highlands region contains many springs which provide an abundant and reliable source of water for streams. Irrigation wells located throughout the area produce from 500 to greater than 3,000 gallons per minute. These wells range from 15 to 120 feet deep (USDA, 1983). Downstream into Arkansas, the abundant water supply in the old Mississippi River floodplain is an important resource. Wells approximately 120 feet deep provide an consistent flow of fair to good quality water at 1,500 to 1,800 gallons per minute (USDA, 1978).

3.5 Cultural Resources

There are many varied archeological and historical resources found in the Black River watershed. However, it is beyond the scope of this EA to specifically document their occurrences. The Corps of Engineers, Little Rock District maintains reports on relevant Corps projects and the cultural resources within the area.

3.6 Biological Resources

3.6.1 Vegetation

In the Highlands region, an oak/hickory/pine forest predominates, with an understory of greenbriers, blackberry, pokeberry, and native grasses. In the Coastal Plain, agricultural land uses dominate. The natural vegetation consists of bottomland hardwoods interspersed with cypress/tupelo swamps. The Black River flows, in part, through portions of the Mark Twain National Forest in Reynolds, Wayne and Butler counties in Missouri.

The scoping process identified concerns with high river stages and an altered hydrologic regime impacting bottomland hardwoods. Scoping letters received from government agencies are included in this document as Appendix A.

3.6.2 Wildlife

The watershed contains considerable acreage of wildlife habitat, including forest lands which support populations of big game (e.g. deer and black bear), as well as small game species such as squirrels, raccoons, rabbits, turkeys, and numerous fur-bearing species.

There are three designated Wildlife Management Areas along the Black River downstream of Clearwater Dam:

- Coon Island Wildlife Management Area (WMA) in Butler County; Missouri;
- Dave Donaldson Black River WMA in Clay and Randolph counties in Arkansas; and
- Shirey Bay-Rainey Brake WMA in Lawrence County, Arkansas.

The aquatic biological communities within the Black River system are diverse and vary with location. The headwater tributaries sustain populations typical of small streams, Clearwater Lake contains reservoir species. The Black River downstream of Clearwater Lake contains Ozark stream fauna including a variety of suckers and sunfishes. Species including golden redhorse, hog sucker, black redhorse, smallmouth bass, spotted bass and longear sunfish are typical species in the river. As the river becomes larger downstream, additional larger river species become more common. Within the Black River system, coldwater tributaries (e.g. Current River and Eleven

Point River) contain a variety of cool water and cold water species including rainbow and brown trout.

3.6.3 Threatened and Endangered Species

The U.S. Department of the Interior, Fish and Wildlife Service (USFWS), the Missouri Department of Conservation (MDOC), and the Arkansas Natural Heritage Commission were contacted to obtain a list of federally Threatened and Endangered Species that are known to occur in the Black River watershed. Four animal species were identified as potentially occurring in the area. Historically, two endangered mussels, the pink mucket pearly mussel (*Lampsilis abrupta*) and the Curtis pearly mussel (*Epioblasma florentina*) have occurred in the Black River between Clearwater Dam and Poplar Bluff, Missouri. However, the last live specimen of the Curtis pearly mussel found in the Black River was in 1971 and it is thought to be extirpated from the Missouri. The threatened bald eagle (*Haliaeetus leucocephalus*) winters in the vicinity of Clearwater Lake.

The one endangered plant species identified as occurring in the Black River watershed is pondberry (*Lindera melissifolia*).

3.6.4 Wetlands

Wetlands, as identified in the National Wetlands Inventory, exist along the length of the Black River. It is beyond the scope of this EA to delineate specific occurrences of jurisdictional wetlands, as defined in the 1987 United States Army Corps of Engineers Wetland Delineation Manual. However, the major types of wetlands found, both jurisdictional and non-jurisdictional, can be characterized as:

- Palustrine Forested Broad-Leaved Deciduous, Seasonally Flooded;
- Palustrine Forested Broad-Leaved Deciduous, Temporarily Flooded;
- Palustrine Scrub-Shrub Broad-Leaved Deciduous, Temporarily Flooded;
- Palustrine Emergent Seasonally Flooded;
- Palustrine Emergent Temporarily Flooded; and
- Riverine Lower Perennial Unconsolidated Shore; Seasonally Flooded.

At a point approximately 10 miles upstream of the Missouri/Arkansas state line, wetlands become more abundant and the wetland type transitions to more seasonally flooded than temporarily flooded, and in places becomes semi-permanently flooded. The scrub-shrub wetland type also becomes relatively more abundant along these reaches (USFWS NWI).

3.7 Air Quality

The air quality in the region is considered good. The majority of the region consists of rural communities which lack major industry-related pollutants.

The Clean Air Act of 1977, as amended, requires Federal facilities to comply with all Federal, state, interstate, and local requirements regarding the control and abatement of air pollution in the same manner as any nongovernmental entity, including any requirement for permits. No particular Federal requirements are involved that are not already incorporated into Arkansas state law. The Black River region is in compliance with all U.S. Environmental Protection Agency ambient air quality standards. The "Conformity Rule" of the Clean Air Act of 1977, as amended (CAA), states that all Federal actions must

conform to appropriate State Implementation Plans. This rule took effect on January 31, 1994, and at present applies only to Federal actions in non-attainment areas (those not meeting the National Ambient Air Quality Standards for the criteria pollutants in the CAA). The Black River region is in an "attainment area" and is therefore exempt from the Conformity Rule of the CAA.

3.8 Socio-economics

3.8.1 Economic Setting

Table 5 summarizes income and occupation at the time of the most recent United States Census.

Table 5. Income and Occupation Information for Black River Study Area.

County	$, per capita income	Primary Categories of Occupation
Butler, MO	9,000	service, administrative, sales, professional, precision production.
Reynolds, MO	8,667	machine operators, precision production, professional, service.
Wayne, MO	8,434	machine operators, precision production, service.

Clay, AR	9,018	machine operators, precision production, farming, service.
Independence, AR	10,493	precision production, administrative, service, machine operators.
Lawrence, AR	8,231	machine operators, precision production, service, administrative.
Randolph, AR	8,219	machine operators, precision production, administrative, professional, sales.
AVERAGE	**8,866**	n/a
Source: 1990 U. S. Census Data		

3.8.2 Population

Population in the seven-county area of consideration is summarized in Table 6.

Table 6. Population Summary for Black River Study Area.

County	Population	Location		Age		
		Urban	Rural	0-29	30-59	60+
Butler, MO	38,765	16,996	21,769	15,907	14,389	8,469
Reynolds, MO	6,661	0	6,661	2,678	2,499	1,484
Wayne, MO	11,543	0	11,543	4,367	4,111	3,065
Clay, AR	18,107	7,100	11,007	6,848	6,381	4,878
Independence, AR	31,192	9,187	22,005	13,239	12,097	5,856
Lawrence, AR	17,457	7,051	10,406	7,244	6,101	4,112
Randolph, AR	16,558	6,151	10,407	6,642	6,105	3,811
TOTAL	**140,283**	**46,485**	**93,798**	**56,896**	**51,654**	**31,675**

Source: 1990 U. S. Census Data

3.8.3 Recreation

The three forks of the Black River originate near the highest point in Missouri, Taurn Sauk Mountain, and join near Lesterville, Missouri to flow toward the lowest section of the state. The upper reach of the river is exceptionally clear and has enough feeder springs to produce some good smallmouth bass fishing. Below Clearwater Lake, the river moves more slowly and is less clear but is still a good float-fishing stream. Some of the most beautiful scenery in Missouri is to be found in the upper reaches of the Black River. This includes several "shut-ins," areas where the stream runs through jumbled rocks and potholes in gorge-like valleys. One such area open to the public is Johnson Shut-ins State Park on the East Fork. Shut-in Creek, a tributary of the East Fork, has a section which drops

70 feet per mile, but these upper shut-ins of the Black River are not boatable (MDOC, 1989).

4.0 ENVIRONMENTAL CONSEQUENCES

Environmental consequences of the proposed change to the authorized Water Control Plan will occur primarily as a function of the change in river stage water levels. Using 50 years of rainfall data, river stages and lake elevations under the current and proposed plans were modeled by Little Rock District, USACE. The modeling results were used to compare lake elevations and river stages at three critical levels. Because the Poplar Bluff gauging station is used as the control point for river stages, the stage at that station was used as the basis of the analysis. Based on information from the Chief of Reservoir Control, Little Rock District, Corps of Engineers, there are three meaningful events which are affected by varying river stages:

- soil inundation outside of the protective levee,
- ponding of water outside of the protective levee, and
- bank overtopping by the river.

Table 7 shows the relationship of these events to river stage.

Table 7. Effects of Various Black River Stages	
River Stage at Poplar Bluff, MO (feet)	**Effect**
6	inundation of soil outside of the protective levee[1]
8	ponding outside of the protective levee[1]
10.5	river at channel capacity[2]
>10.5	river exceeds channel capacity
Sources: [1] *Chief of Reservoir Control, Little Rock District, USACE* [2] *Clearwater Lake / Black River Water Control Manual*	

Using the modeling results, the number of days per month and number of days per year were calculated for each lake elevation and river stage. This analysis was conducted for both the current, authorized Water Control Plan and the proposed change to the Plan. Figures 4.1-4.6 are graphic representations of the analysis results.

Under the proposed plan, there would be a reduction in the number of days during the growing season (defined as April 15 through October 15) that lake elevations would result in river stages with potential impacts along the Black River (i.e. those of 6 feet or greater). Table 8 lists these numbers of days.

Table 8. Days During Growing Season at River Stages with Potential for Impact			
River Stage (feet)	**Days at Stage - Current Plan**	**Days at Stage - Proposed Plan**	**Change under Proposed Plan (days)**
>6	27.8	21.9	- 5.9
>8	22.9	15.5	- 7.4
>10.5	7.6	7.7	+ 0.1
Note: Each lower river stage includes those days at or above the higher stages.			

If the proposed changes in the Water Control Plan are implemented, in a typical year, there will be 5.9 fewer days during the growing season when the river stage could result in soil saturation outside of the levee, 7.4 fewer days when the river stage could result in ponding of water outside the levee, and 0.1 more days when the river could overtop its banks.

Figure 4.1 Typical Days per Month at Proposal Lake Elevations under Current Plan

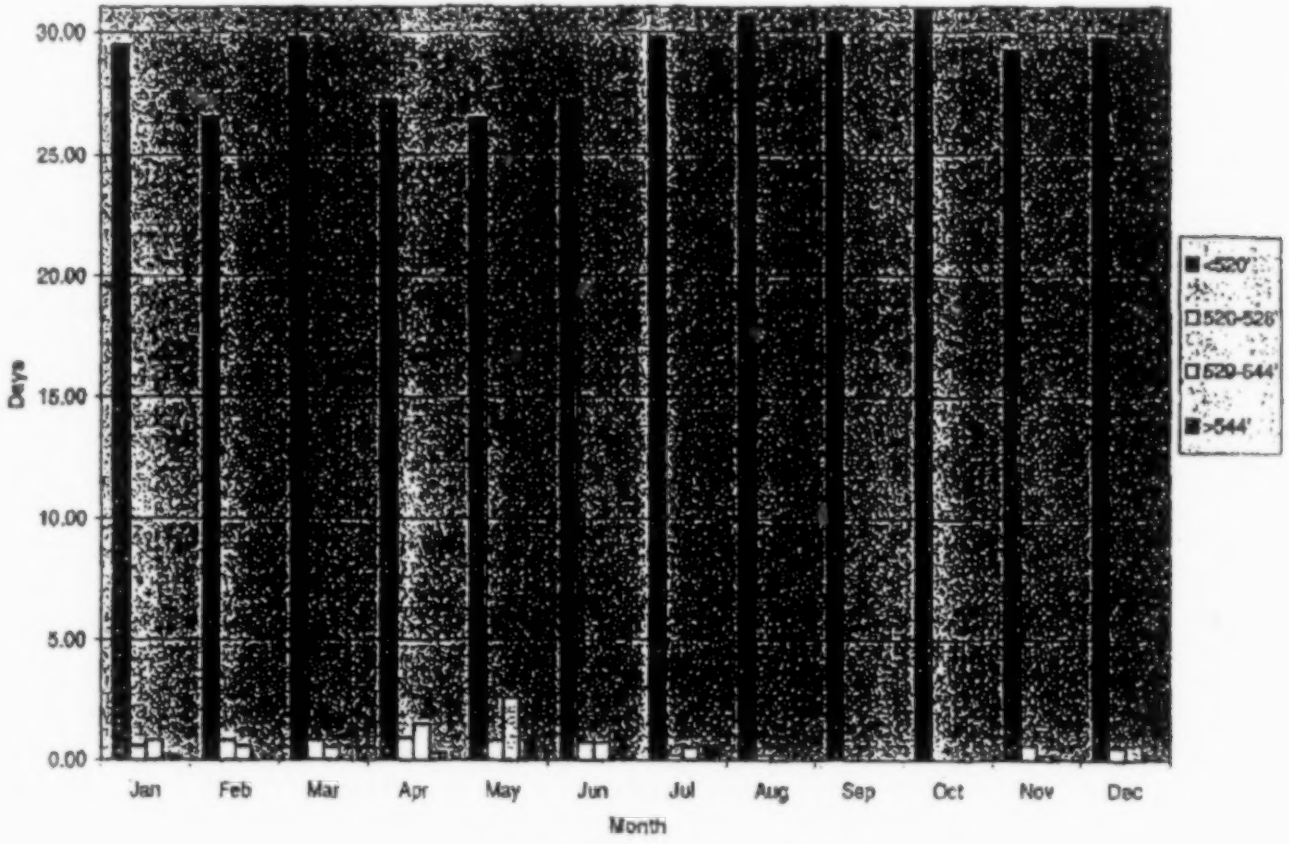


Figure 4.2 Typical Days per Month at Proposal Lake Elevations under Proposed Plan

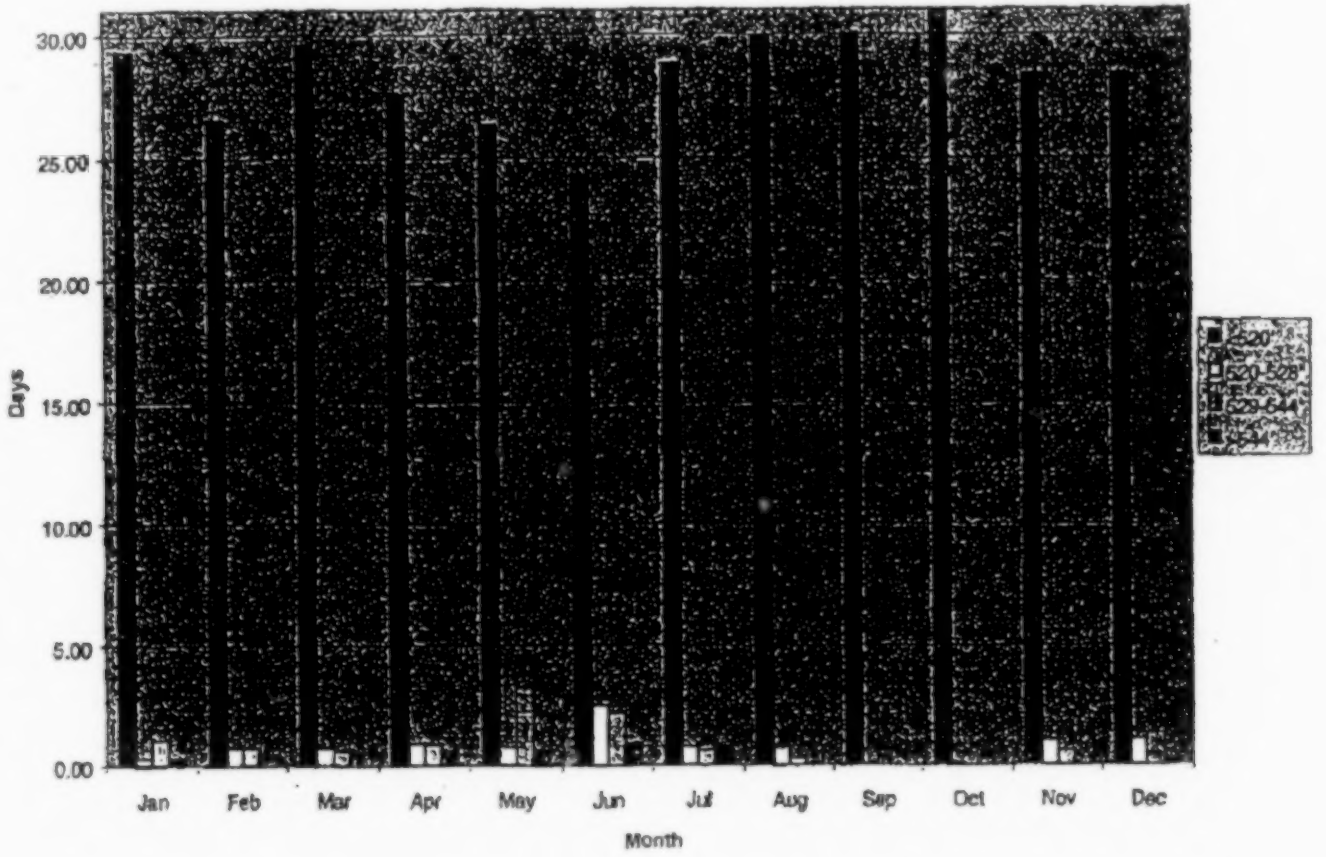


Figure 4.3 Typical Days per Month at Proposal River Stages under Current Plan

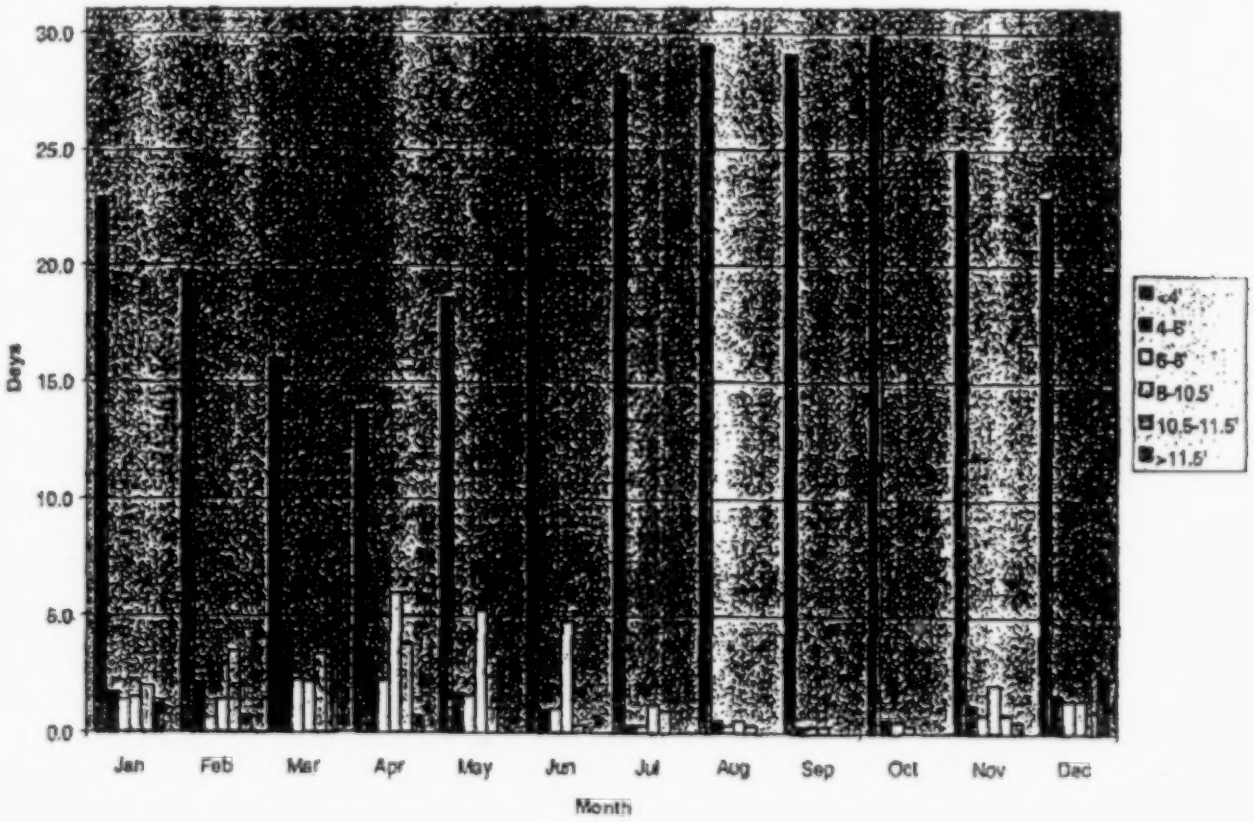


Figure 4.4 Typical Days per Month at Proposal River Stages under Proposed Plan

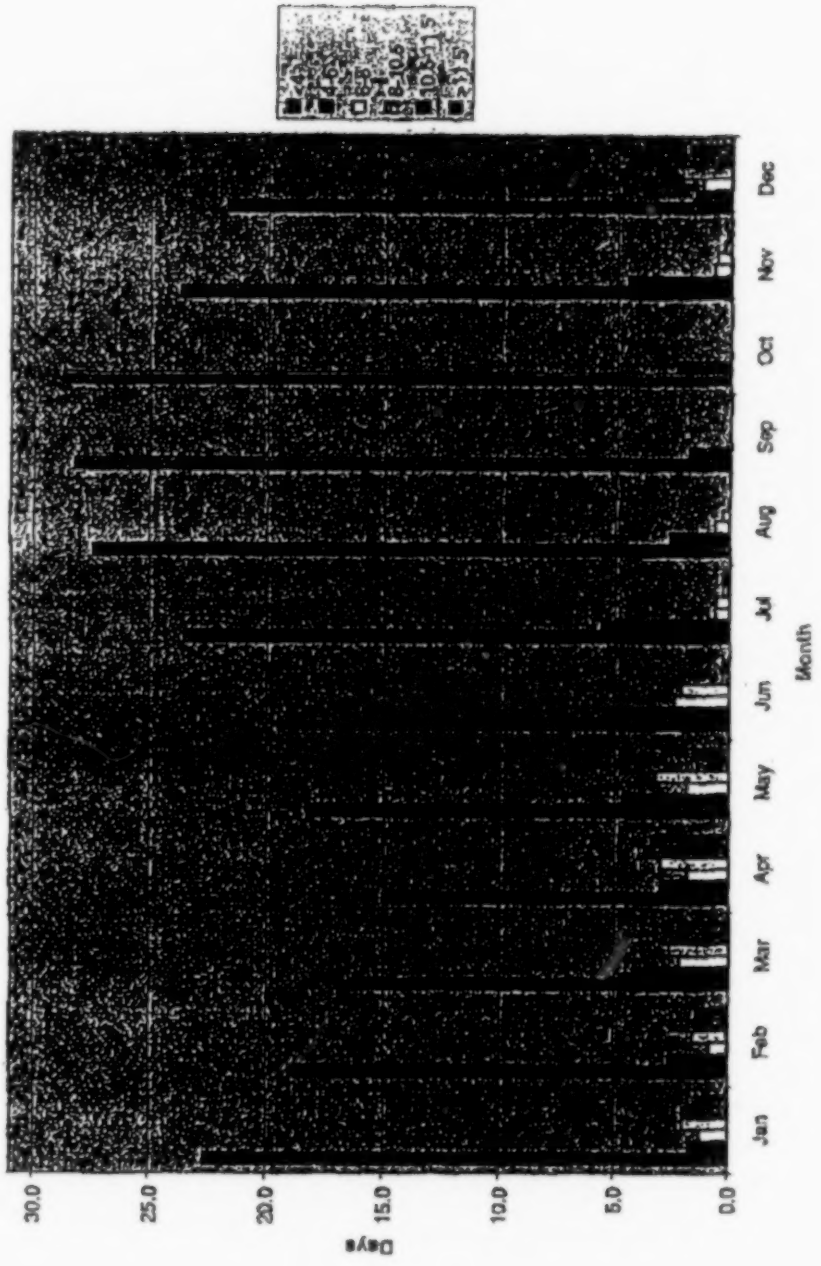


Figure 4.5 Typical Days per Month at Critical River Stages under Current Plan

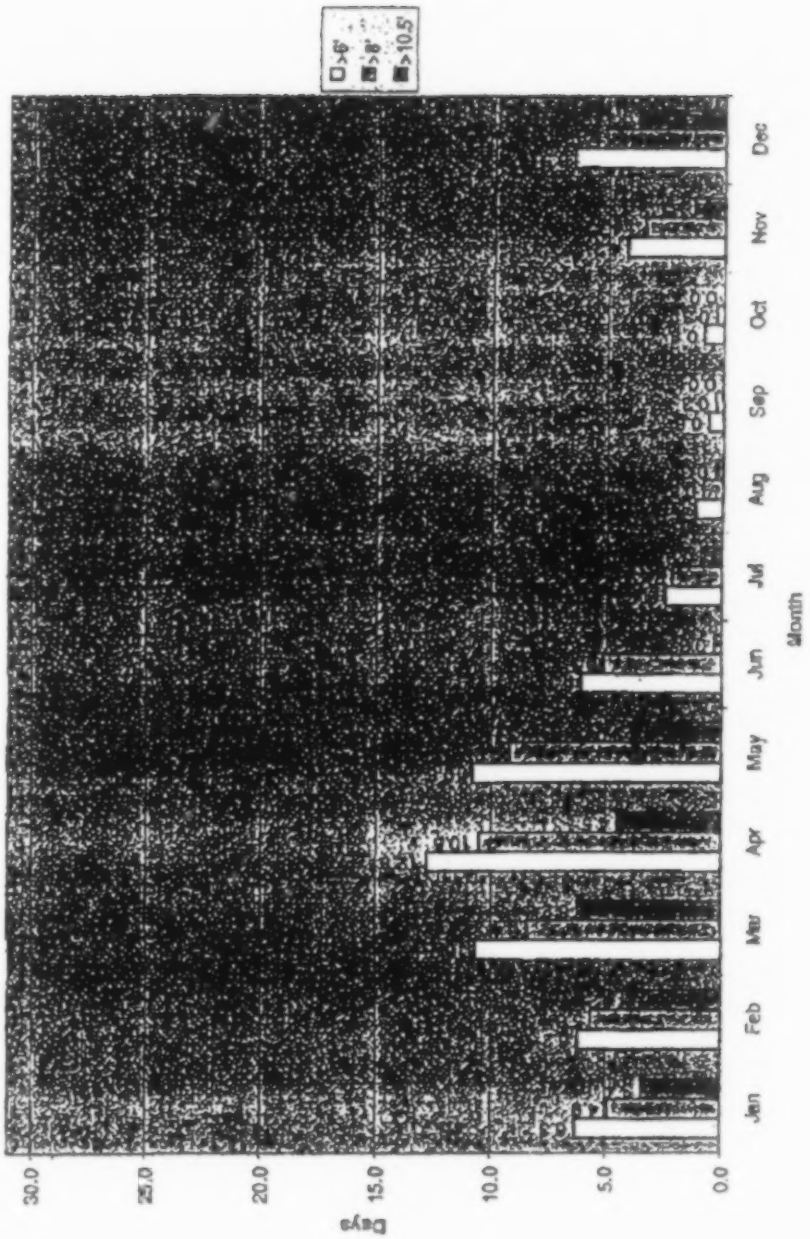
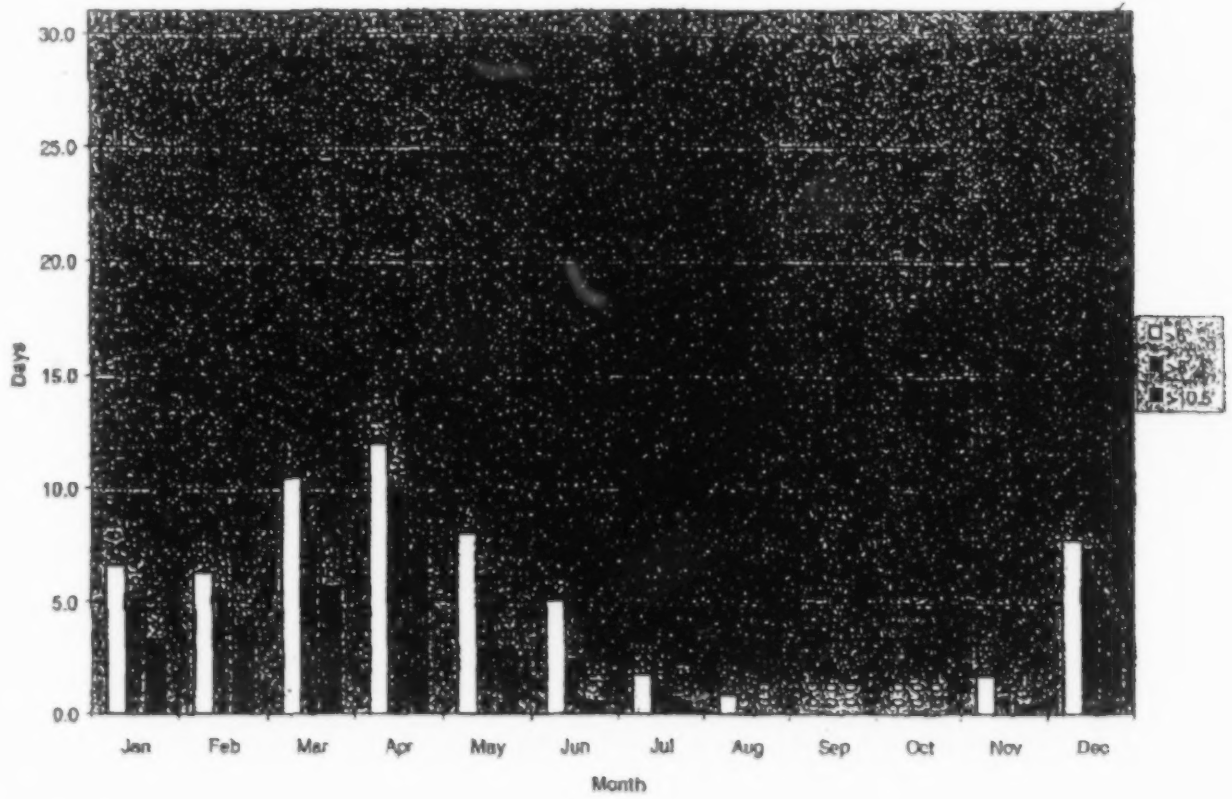


Figure 4.6 Typical Days per Month at Critical River Stages under Proposed Plan



4.1 Land Use

4.1.1 Agricultural Crops

No Action There will be adverse impacts to agricultural crops as a result of maintaining the current Water Control Plan. Farmland soils will continue to be saturated and ponded at times during the growing season.

Proposed Action There will be beneficial impacts to agricultural crops as a result of implementing the proposed action. There will be less soil saturation and ponding of farmland during the growing season. In addition, these changes will be concentrated in the months of April, May and June, when planting occurs.

4.1.2 Timber

No Action There will be adverse impacts to commercial timber as a result of maintaining the current Water Control Plan. Woodland soils will continue to be inundated at times during the growing season. Extended inundation can result in impacts to species composition and habitat deterioration.

Proposed Action There will be minor beneficial impacts to commercial timber as a result of implementing the proposed action. As noted in section 3.1.2, the majority of the timber in proximity to the Black River is contained on the river side of man-made levees. Outside the levees, on the other side away from the river, there will be less soil saturation and ponding of areas in timber during the growing season. When the river floods out of its banks, by design the levee has the effect of holding water on those areas within the levees. Extended inundation can result in impacts to species composition and habitat deterioration.

Based on information provided by the Arkansas Game and Fish Commission (AGFC), analysis was conducted on a 4-foot river stage at Poplar Bluff. According to AGFC, a 4-foot river stage at Poplar Bluff results in a 6-foot river stage at Corning, Arkansas and the Dave Donaldson Black River Wildlife Management Area. As shown in Figures 4.3 and 4.4, the proposed action would result in 11 more days at a 4-foot river stage at Poplar Bluff during the growing season in a typical year.

If there is a direct correlation of a 4-foot river stage at Poplar Bluff to a 6-foot river stage at Corning, 44.6 days during the growing season of a typical year would have the potential for inundation, ponding, and/or bank overtopping. The 44.6 day period is nearly 25 percent of the growing season and represents a significant adverse impact to hardwoods growing in the Dave Donaldson Black River WMA. The predominant species in the Dave Donaldson Black River WMA, Water oak (*Quercus nigra*) and Willow oak (*Quercus phellos*), are weakly tolerant of flooding. Weakly tolerant is defined as:

> *Survives flooding into growing season for a few days or weeks, but trees do not develop adaptations for low oxygen levels. Not tolerant of any flooding above the root crowns during the growing season but flooding for 1 month annually may occur regularly during the dormant season* (Fredrickson and Batema).

Since Water oak and Willow oak are important mast-producing waterfowl food source trees at the Dave Donaldson Black River WMA, the extended inundation could result in adverse impacts to species composition and habitat deterioration.

4.1.3 Floodplains

No Action No impacts to the function of the floodplains along the Black River are anticipated if the current Water Control Plan is continued. No changes to the Base Flood Elevation, as shown on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) are anticipated.

Proposed Action No construction is planned with the proposed action. Therefore, the function of the floodplains along the Black River will not be affected. No changes to the Base Flood Elevation, as shown on the FEMA FIRMs, are anticipated.

4.2 Climate

No Action No changes to climate will occur as a result of continuing with the current Water Control Plan.

Proposed Action No changes to climate will occur as a result of the proposed action.

4.3 Geology

4.3.1 Topography and Physiography

No Action No changes to topography and physiography will occur as a result of continuing with the current Water Control Plan.

Proposed Action No changes to topography or physiography will occur as a result of the proposed action.

4.3.2 Soils

No Action Soils in the proximity of the Black River will continue to be inundated at approximately the same

frequency as they are presently if the current Water Control Plan is continued.

Proposed Action Soils in the proximity of the Black River will be less frequently inundated with implementation of the proposed action.

4.4 Water Resources

4.4.1 Surface Water

No Action There will be no impacts to surface water as a result of continuing the current Water Control Plan. Typical current conditions for the Black River are represented graphically in Figures 4.3.

Proposed Action There will be no impacts to surface water as a result of the implementing the proposed action. When considered by month, the changes in the amount of time the Black River will be at different stages are small. These changes are represented graphically in Figure 4.4

4.4.2 Ground Water

No Action There will be no change in the prevailing groundwater level as a result of continuing the current Water Control Plan.

Proposed Action There is the potential for minor impacts to ground water as a result of the implementing the proposed action. The reduction in days at which the river is at a stage which could result in saturation or ponding may have an effect on ground water near the surface. When considered by month, the changes in the amount of time the river will be at different stages are small.

4.5 Cultural Resources

No Action There will be no impacts to cultural resources as a result of continuing the current Water Control Plan.

Proposed Action There will be no impacts to cultural resources as a result of the implementing the proposed action.

4.6 Biological Resources

4.6.1 Vegetation

No Action Vegetation in proximity to the Black River will be inundated and ponded upon at approximately the same frequency as it is presently. This has the potential of being a beneficial or detrimental impact, depending on the use and the management of the vegetation in question. For example, vegetation managed as wetlands to benefit wildlife would experience impacts different from vegetation managed as commercial crops. Sections 4.1.1 and 4.1.2 discuss impacts to agricultural crops and commercial timber.

Proposed Action Vegetation in proximity to the Black River will be less frequently inundated and ponded upon as a result of implementing the proposed action. This has the potential of being a beneficial or detrimental impact, depending on the use and the management of the vegetation in question. Sections 4.1.1 and 4.1.2 discuss impacts to agricultural crops and commercial timber.

4.6.2 Wildlife

No Action There will be no impacts to wildlife as a result of continuing the current Water Control Plan. Those areas of the Coon Island WMA outside of the

levees will be inundated and ponded upon at approximately the same frequency as they are presently.

No impacts to aquatic biota are expected. No changes in river flow or habitat availability are expected, since the management of stream flows in the river will remain unchanged.

Proposed Action Those areas of the Coon Island WMA outside of the levees will be less frequently inundated and ponded with implementation of the proposed action. As noted in section 3.1.2, the majority of the timber in proximity to the Black River is contained within protective levees. When the river floods out of its banks, by design the levee has the effect of holding water on those areas within the levees. Extended inundation can result in impacts to species composition and habitat deterioration.

The Dave Donaldson Black River Wildlife Management Area is downstream of the Missouri/ Arkansas state line. As discussed in Section 4.1.2, Water oak and Willow oak are important mast-producing waterfowl food source trees at the Dave Donaldson Black River WMA. Therefore, the extended inundation could result in adverse impacts to tree species composition and waterfowl habitat deterioration.

The Shirey Bay-Rainey Brake WMA is also downstream of the Missouri/Arkansas state line. This WMA is too far downstream to be substantially affected by the proposed action.

No impacts to aquatic species are anticipated as a result of implementing the proposed action. River flows during the spring, when many fish species spawn, will remain similar to existing conditions. River flows during the summer will also be similar to existing conditions. Additionally, the proposed plan include a minimum flow of 150 cubic feet per second which provides ample flow to sustain the fishery in the river.

4.6.3 Threatened and Endangered Species

No Action No impacts to threatened or endangered species are expected to result from continuing with the current Water Control Plan.

Proposed Action No impacts to threatened or endangered species are expected to result from implementation of the proposed action.

4.6.4 Wetlands

No Action Wetlands in the Black River watershed will not be affected by continuing with the current Water Control Plan. The wetland water regime will remain as it is presently.

Proposed Action Wetlands in the Black River watershed will not be affected by the proposed action. Although there will be a reduction in soil inundation and ponding, there should not be an overall impact on the wetland water regime which would have an impact on wetlands.

4.7 Air Quality

No Action No impacts to air quality are expected to result from continuing with the current Water Control Plan.

Proposed Action No impacts to air quality are expected to result from implementation of the proposed action.

4.8 Socio-economics

4.8.1 Economic Setting

No Action There will be adverse impacts to the economic setting as a result of maintaining the current Water Control Plan. Farmland and woodland soils will continue to be saturated and ponded at times during the growing season, resulting in impacts on access to fields for planting and inhibited field crop growth.

Proposed Action There will be beneficial impacts to the economic setting as a result of implementing the proposed action. There will be less soil saturation and ponding of farmland and woodland during the growing season. In addition, these changes will be concentrated in the months of April, May and June, when planting occurs.

4.8.2 Population

No Action No impacts to population are expected to result from continuing with the current Water Control Plan.

Proposed Action No impacts to population are expected to result from implementation of the proposed action.

4.8.3 Recreation

No Action No impacts to recreation are expected to result from continuing with the current Water Control Plan.

Proposed Action No impacts to recreation are expected to result from implementation of the proposed action.

5.0 FINDINGS

The proposed action, the implementation of an updated U.S. Army Corps of Engineers Clearwater Lake Water Control Plan, has the potential for significant impacts on the natural or cultural resources present. This finding is based on information provided by the Arkansas Game and Fish Commission (AGFC) indicating that a 4-foot Poplar Bluff river stage results in a 6-foot river stage at Corning, Arkansas and the Dave Donaldson Black River Wildlife Management Area.

The direct correlation of a 4-foot river stage at Poplar Bluff to a 6-foot river stage at Corning, would result in 44.6 days during the growing season of a typical year having the potential for inundation, ponding, and/cr bank overtopping. The 44.6 day period is an increase of 11 days over the current Water Control Plan. The 44.6 day period is nearly 25 percent of the growing season and represents a significant adverse impact to hardwoods growing in the Dave Donaldson Black River WMA. The predominant species in the Dave Donaldson Black River WMA, Water oak (*Quercus nigra*) and Willow oak (*Quercus phellos*), are weakly tolerant of flooding. Since Water oak and Willow oak are important mast-producing waterfowl food source trees at the Dave Donaldson Black River WMA, the extended inundation could result in adverse impacts to species composition and habitat deterioration.

Therefore, a finding of no significant impact cannot be supported. Under the provisions of Engineering Regulation 200-2-2, Procedures for Implementing NEPA and 40 CFR 1508.9, to continue with this

proposed action would require the preparation of an Environmental Impact Statement.

JOINT EXHIBIT 20

* * *

DRAFT

DAVE DONALDSON BLACK RIVER WILDLIFE MANAGEMENT AREA

REVIEW OF AVAILABLE DATA AND RECOMMENDATIONS

Prepared for:

Arkansas Game and Fish Commission
2 Natural Resources Drive
Little Rock, AR 72205

Prepared by:

ATOKA, Inc.
426 Winona
Hot Springs, AR 71901
501-623-1121

April 20, 2001

* * *

Figure 3

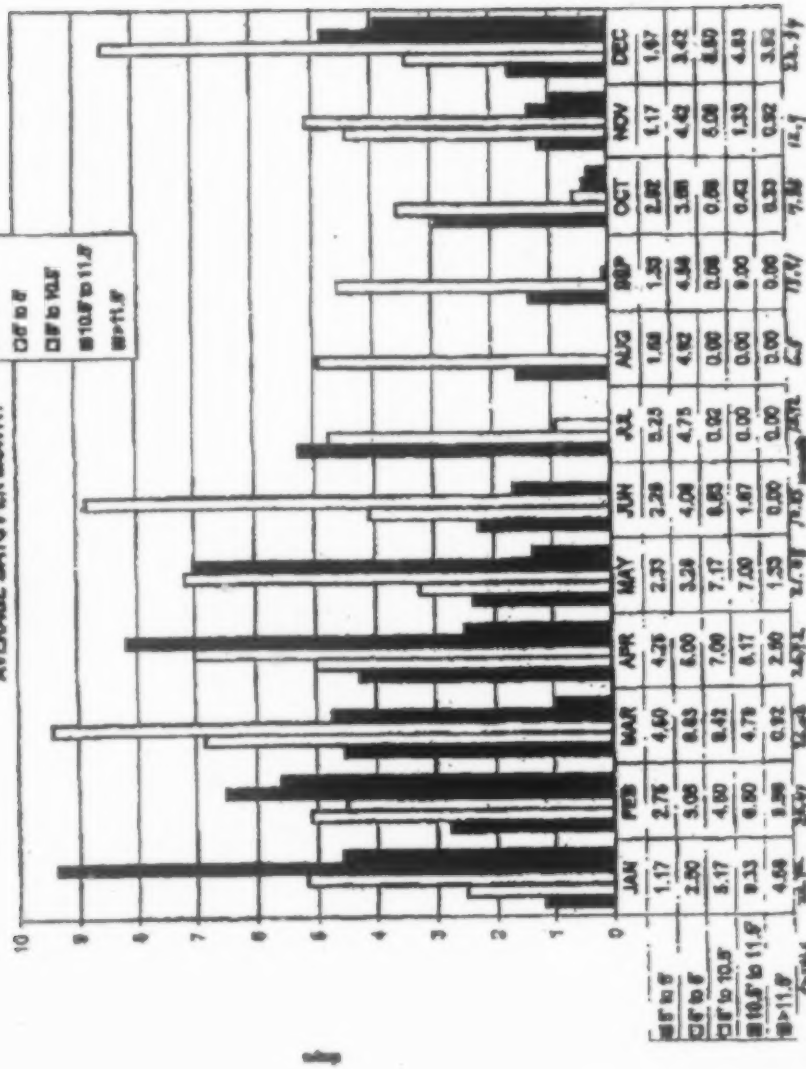
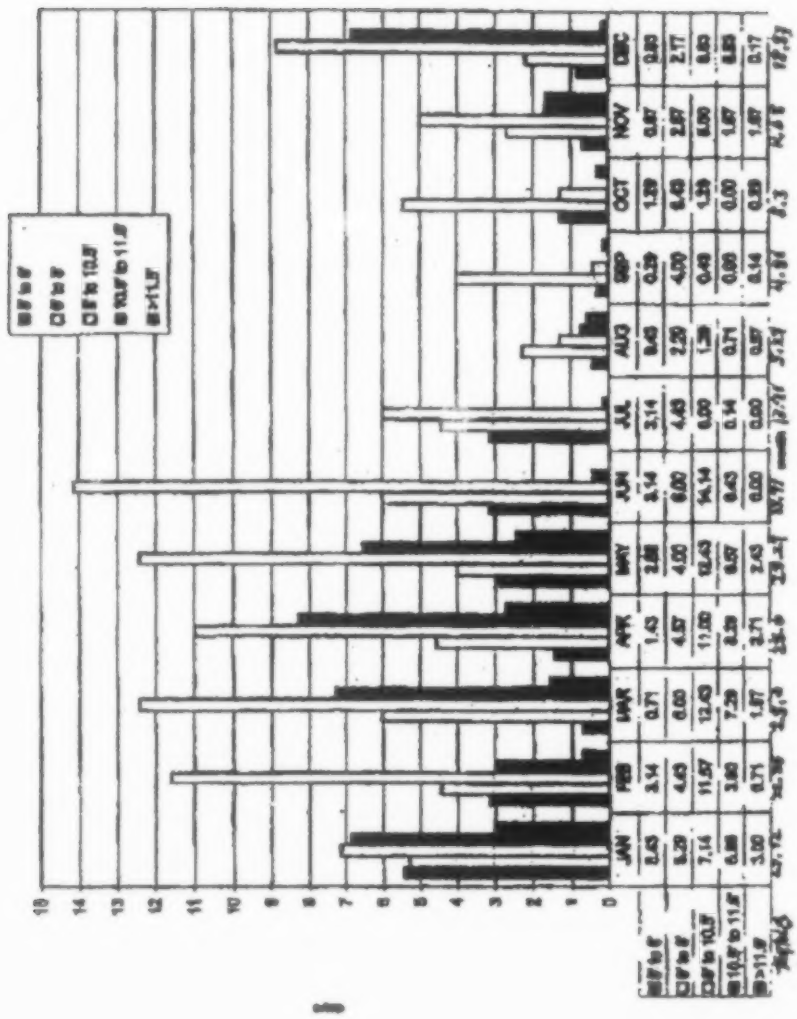

1991-1992
CORNING GAUGE HEIGHTS
AVERAGE DAYS PER MONTH
10
9
8
7
6
5
4
3
2
1
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

FIGURE 4

1983-1988

CORNING GAUGE HEIGHTS

AVERAGE DAYS PER MONTH



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IN THE UNITED STATES COURT OF FEDERAL CLAIMS

No. 05-381 L
Judge Charles F. Lettow

[Filed December 19, 2008]

ARKANSAS GAME & FISH COMMISSION	)
Plaintiff	)
v.	)
UNITED STATES OF AMERICA	)
Defendant	)

JOINT STIPULATED FINDINGS OF FACT

Plaintiff, Arkansas Game & Fish Commission, and Defendant, United States of America, by and through their respective counsel, hereby submit this Joint Stipulated Findings of Fact pursuant to Appendix A, paragraph 17, of the Rules of the Court of Federal Claims.

1. This Court has jurisdiction over alleged violations of the Fifth Amendment pursuant to the Tucker Act, 28 U.S.C. § 1491. *See* Complaint at ¶ 4; Answer at ¶ 4.

2. Plaintiff Arkansas Game and Fish Commission ("AGFC") is a constitutionally independent agency of the State of Arkansas. *See*

Complaint at ¶ 1; Answer at ¶ 1. The mission of the Arkansas Game and Fish Commission is to wisely manage all of the fish and wildlife resources of Arkansas while providing maximum enjoyment for the people of the State.

3. Defendant United States, through its agency, the U.S. Army Corps of Engineers ("Corps") has responsibility for, among other things, the operation of Clearwater Lake as a flood control project. *See* Complaint at ¶ 2; Answer at ¶ 2.

4. AGFC owns the Dave Donaldson Black River Wildlife Management Area ("Black River WMA") located along both banks of the Black River in Clay, Greene, and Randolph Counties in northeastern Arkansas.

5. The Corps owns and operates Clearwater Lake and serves as the regulatory agency for the lake. *See* Complaint at ¶ 2; Answer at ¶ 2.

6. The Reservoir Control Branch of the Corps is responsible for the regulation of Clearwater Lake. *See* Complaint at ¶ 2; Answer at ¶ 2.

7. Clearwater Lake is located on the Black River in Missouri, upstream of the Black River WMA. *See* Complaint at ¶ 8; Answer at ¶ 8.

8. The construction of Clearwater Lake was authorized by the Flood Control Act of 1938 for flood control and other purposes in the White River Basin. *See* Complaint at ¶ 9; Answer at ¶ 9.

9. Clearwater Dam was completed in 1948, and is located on the Black River at river mile 257.4 in Reynolds and Wayne Counties in southeastern Missouri, approximately 32 miles northwest of Poplar Bluff, Missouri. *See* Complaint at ¶ 9; Answer at ¶ 9.

10. Clearwater Dam regulates the flow from 898 square miles of drainage area. *See* Complaint at ¶ 9; Answer at ¶ 9.

11. The Clearwater Lake Water Control Manual ("the Manual") provides guidance to Corps personnel concerned with, or responsible for, regulation of Clearwater Lake during the life of the project. *See* Complaint at ¶ 11; Answer at ¶ 11; AGFC Exhibit 58 at AGFC 0550 to AGFC 0737 and USA Exhibit 285, US 0754 to US 01023.

12. The Manual, which the Corps originally released in 1953 and revised in 1995, documents the required Water Control Plan for Clearwater Lake. *See* Complaint at ¶ 11; Answer at ¶ 11.

13. The 1953 Water Control Plan for Clearwater Lake prescribes that releases of lake water are to be sized and timed such that those releases, when combined with uncontrolled flow entering the Black River from tributaries below Clearwater Dam, do not exceed a stage at the Poplar Bluff, Missouri gage (the official gaging station) of 11.5 feet during the period from December 1 through March 31 (nonagricultural season) and 10.5 feet during the period April 1 through November 30 (agricultural season). *See* Complaint at ¶ 12; Answer at ¶ 12.

14. The 1995 revision of the Manual included the 1953 Water Control Plan for Clearwater Lake. *See* Complaint at ¶ 12; Answer at ¶ 12.

15. Beginning in 1993 and continuing through 2000, the Corps approved and implemented various deviations to the regulated water releases from Clearwater Dam to certain deviated targets at the Poplar Bluff, MO gauge.

17. AGFC prepared a Master Plan for development and management of the natural resources on Black River WMA dated July 12, 1984. *See* JX 23 at AGFC 2576 to AGFC 2976.

18. To facilitate timber management for Black River WMA, AGFC defined 14 areas, termed "Timber Compartments" across the WMA. *See* JX 23 at AGFC 2779 to AGFC 2792.

19. Timber Compartment boundaries typically were designated to coincide with permanent features, such as streams and roads. *See* JX 23 at AGFC 2831.

20. Since 1984, AGFC has conducted or hired contractors to conduct timber inventories on Timber Compartments on the WMA.

21. AGFC also has prepared "Prescriptions" for its Timber Compartments to summarize inventory data and prescribe management treatments.

22. Since 1984, AGFC has prepared Prescriptions for the Timber Compartments on the WMA as follows:

Compart-ment Number	Date	Pages	JX Number
1	March 21, 1984	AGFC-03335 to AGFC-03343	48
1	January 30, 2003	AGFC-03344 to AGFC-03359	49
2	September 29, 1987	AGFC-03384 to AGFC-03394	51
2	March 1, 1995	AGFC-03360 to AGFC-03383	50
3	February 26, 1990	AGFC-03395 to AGFC-03430	52
3	February 11, 1998	AGFC-03431 to AGFC-03451	53
4	August 5, 1987	AGFC-03452 to AGFC-03464	54
5	December 18, 1988	PL000878 to PL000922	141 (partial)
5	October 1995	PL006934 to PL006949	DX258
5	May 13, 1996	AGFC-03498 to AGFC-03510	56

Compart-ment Number	Date	Pages	JX Number
6	April 1, 1986	AGFC-03511 to AGFC-03521	57
6	September 9, 1993	AGFC-03522 to AGFC-03551	58
7	April 5, 1991	AGFC-03569 to AGFC-03623	60
7	March 23, 1999	AGFC-03552 to AGFC-03568	59
8	February 25, 1992	AGFC-03212 to AGFC-03270	37
8	August 28, 2000	AGFC-02977 to AGFC-02989	24
9	July 31, 1985	AGFC-03624 to AGFC-03636	61
9	September 27, 1993	AGFC-03637 to AGFC-03677	62
10	March 15, 1990	AGFC-03678 to AGFC-03705	63
10	April 23, 1998	AGFC-03706 to AGFC-03723	64

Compartment Number	Date	Pages	JX Number
11	November 20, 1988	AGFC-03724 to AGFC-03735	65
11	March 3, 1997	AGFC-03736 to AGFC-03755	66
12	January 22, 1992	AGFC-03756 to AGFC-03810	67
13	December 26, 1988	AGFC-03811 to AGFC-03824	68

23. The parties agree that the National Oceanic Atmospheric Administration (NOAA) maintains rainfall data for various locations including Poplar Bluff, Missouri, and Corning, Arkansas. The actual NOAA records for Poplar Bluff, Missouri and Corning, Arkansas from 1981 through 2000 records are voluminous and not attached hereto, but may be used by the parties, as necessary, in post-trial briefing. These records can be accessed electronically at NOAA's website at www.ncdc.noaa.gov/dailyform/DlyFORMv2.

This report was jointly prepared by counsel for the parties. Counsel for Defendant has authorized Counsel for Plaintiff to file this Joint Stipulated Findings of Fact on behalf of both parties.

DATED: December 19, 2008

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PETITIONER'S BRIEF

RECORD
AND
BRIEFS

No. 11-597

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In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITIONER'S BRIEF ON THE MERITS

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QUESTION PRESENTED

Petitioner Arkansas Game & Fish Commission, a constitutional entity of the State of Arkansas, sought just compensation from the United States under the Takings Clause of the Fifth Amendment for physically taking its bottomland hardwood timber through six consecutive years of protested flooding during the sensitive growing season. The Court of Federal Claims awarded $5.7 million, finding that the Army Corps of Engineers' actions foreseeably destroyed and degraded more than 18 million board feet of timber, left habitat unable to regenerate, and preempted Petitioner's use and enjoyment. The Federal Circuit, with its unique jurisdiction over takings claims, reversed the trial judgment on a single point of law. Contrary to this Court's precedent, a sharply divided 2-1 panel ruled that the United States did not inflict a taking because its actions were not permanent and the flooding eventually stopped. The Federal Circuit denied rehearing *en banc* in a fractured 7-4 vote. The question presented is:

> Whether government actions that impose recurring flood invasions must continue permanently to take property within the meaning of the Takings Clause.

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The opinion of the Court of Federal Claims is reported at 87 Fed. Cl. 594 and reproduced at Pet. App. 38a. The opinion of the Federal Circuit is reported at 637 F.3d 1366 and reprinted at Pet. App. 1a. The Federal Circuit's order denying panel rehearing and rehearing *en banc* is reported at 64 F.3d 1377 and reproduced at Pet. App. 162a.

JURISDICTION

The Federal Circuit rendered its decision on March 30, 2011. On May 13, 2011, the Arkansas Game and Fish Commission petitioned for rehearing *en banc*. The Federal Circuit denied panel rehearing and rehearing *en banc* on August 11, 2011. A timely petition for a writ of certiorari was filed on November 9, 2011. This Court granted the petition on April 2, 2012. This Court has jurisdiction under 28 U.S.C. § 1254(1).

CONSTITUTIONAL PROVISION AND STATUTES INVOLVED

The Fifth Amendment to the United States Constitution provides in pertinent part: "[N]or shall private property be taken for public use, without just compensation."

Section 1 of Amendment 35 to the Constitution of the State of Arkansas states: "The control, management, restoration, conservation and regulation of birds, fish, game and wildlife resources of the State, including hatcheries, sanctuaries, refuges, reservations and all property now owned, or used for

said purposes and the acquisition and establishment of same, the administration of the laws now and/or hereafter pertaining thereto, shall be vested in a Commission to be known as the Arkansas State Game and Fish Commission, to consist of eight members. Seven of whom shall be active and one an associate member who shall be the Head of the Department of Zoology at the University of Arkansas, without voting power."

A relevant portion of the Flood Control Act of 1928, as codified at 33 U.S.C. § 702c, is reproduced at Pet. App. 182a.

33 C.F.R. 211.1 states: "The term *real estate* as used in this part includes land; buildings; piers and wharves; office and storage space; rights-of-way or easements, whether temporary or permanent; and any interests which may be acquired or held therein for the use or benefit of the United States by the Department of the Army or any branch thereof."

STATEMENT OF THE CASE

Since the 1950s, the Arkansas Game and Fish Commission ("Commission") has operated and maintained the Dave Donaldson Black River Wildlife Management Area ("Management Area")—one of the largest contiguous areas of bottomland hardwood forest in the Upper Mississippi Alluvial Valley—in an effort to preserve unique habitat for migratory birds and other wildlife. From 1993 to 2000, the United States Army Corps of Engineers ("Corps") deviated from its approved 1953 Clearwater Lake Water Control Manual for releases into the Black River at its upstream Clearwater Dam. The deviations caused six

consecutive years of flooding across large sections of the 23,000-acre Management Area, killing or degrading nearly 18 million board feet of timber. This devastation has continued to impede the Commission's ability to operate the Management Area for the conservation and recreational purposes it was intended to serve. According to a majority of the Federal Circuit, the United States need not pay just compensation to the Commission for the destruction it caused.

The Federal Circuit's divided decision (2-1) reverses a 61-page trial opinion by the Court of Federal Claims (Judge Charles F. Lettow) that considered the substantiality and foreseeability of the flooding on the Management Area as well as other relevant factors before awarding the Commission approximately $5.6 million for the timber taken by the Corps, plus an additional $176,428.34 for regeneration of forest habitat. The Federal Circuit's reversal conversely focuses on a single factor: the temporary nature of the Corps' flooding actions. The Federal Circuit perceives a categorical rule that temporary government action can never be a taking if the government does not intend to create a permanent flooding condition. This rule, which dissenters described as a "rigid, unworkable, and inappropriate black letter rule" that "contradicts the entire body of precedent relating to the application of the Fifth Amendment to government-induced flooding," remains undisturbed following the Federal Circuit's splintered (7-4) denial of rehearing and rehearing *en banc*. *See* Pet. App. 37a (Newman, J., dissenting), 176a (Moore, J., et al., dissenting from denial of rehearing). This Court should reject it and reaffirm that temporary flooding can constitute a taking.

A. The Black River Wildlife Management Area

The Arkansas Game and Fish Commission was created by Amendment 35 to the Arkansas Constitution, which vests it with responsibility and authority for "[t]he control, management, restoration, conservation and regulation of birds, fish, game and wildlife resources of the State . . . ." Ark. Const. amend. 35. The Commission fulfills this responsibility, in part, through the purchase and establishment of wildlife management areas throughout the State of Arkansas. The Commission operates its wildlife management areas, often the last remaining forests in many regions of the state, with the goal of preserving habitat for various indigenous and migratory species while maintaining wildlife at healthy and sustainable levels. These areas also provide public recreational opportunities.

Purchased by the Commission in the 1950s and 1960s, the Dave Donaldson Black River Wildlife Management Area contains roughly 23,000 acres and is located along 25 miles of the Black River in northeast Arkansas. J.A. 478, 732 ¶4. It and adjacent privately-owned property form one of the largest contiguous segments of bottomland hardwood forest remaining in any floodplain in the Mississippi Alluvial Valley. J.A. 437. The diverse hardwood timber species found in this forest community—including nuttall, overcup, and willow oaks—support one of the richest communities of fish, amphibian, reptile, bird, and mammal species in North America. J.A. 456; *see also* J.A. 382-84, 416. In particular, the Management Area has been identified as critical wintering habitat for migratory waterfowl that pass through on the

Mississippi River flyway and for many state- and federally-listed threatened and endangered species of plants and animals. J.A. 435, 437.

In pursuit of its state constitutional charge, the Commission developed several greentree reservoirs ("GTRs") on the Management Area. Since the 1960s, GTRs have been flooded annually from mid-November through January when the trees are dormant to provide cover and food for migratory waterfowl during the winter months and a public hunting area for sportsmen. Impounded water is released after the major waterfowl migration ends and typically drains from the GTRs by the end of February. The Commission also periodically inventories forested areas to monitor species composition, stand structure and stocking, and the vigor of the forest. The Commission develops management plans that include systematic harvesting of mature oaks and thinning and regeneration cuts to promote improved and continued habitat.

These practices have allowed the Management Area to thrive and have established it as both a premier duck hunting area and a popular location for birdwatching, fishing, and other types of hunting. The Commission's regional wildlife supervisor described the general condition of the forest when he began working for the Commission in 1978 as "great." J.A. 53. He observed no obvious problems with the forest's health and heard no report of such problems. J.A. 53-54. The Commission's regional habitat biologist, who is a registered forester, agreed that he was "amazed" by the Management Area in the early 1980s. J.A. 82. He "had never seen that much large nuttall oak in one location before" and was impressed with the health

and obvious growth of the trees. J.A. 82. Aerial photos taken in the mid-1980s confirm the uniformity and smoothness of the forest canopy. J.A. 487. In the early 1990s, the Management Area continued to be "the most beautiful intact bottomland hardwood forest" that one Commission forest manager had ever seen. J.A. 74.

B. The Corps of Engineers' Deviations from the Authorized Clearwater Lake Water Control Manual

Clearwater Lake and Dam is located in southeastern Missouri upstream from the Management Area and approximately 32 miles northwest of Poplar Bluff, Missouri. The Corps has managed controlled releases of water from the dam since construction was completed in 1948. J.A. 732-33 ¶¶5, 9. The Clearwater Lake Water Control Manual was issued by the Corps in 1953 to govern those releases. J.A. 733 ¶¶11-12. Per the manual's plan, water was released in short, high discharge pulses in late winter and early spring resulting in short-term overbank flooding along the lower Black River in southern Missouri and northeast Arkansas. *See* J.A. 504-30. The Corps generally followed this procedure for forty years. *See* J.A. 379. As a result, floodwaters typically receded before the end of May of each year, and the hardwood timber growing on the Management Area thrived. J.A. 379. From 1993 to 2000, however, the Corps implemented a series of deviations from the authorized plan. J.A. 734 ¶15; *see also* Pet. App. 47a-48a.

The Corps initially only requested a deviation for the fall and winter of 1993 to benefit upstream farmers

and reduce flooding on their properties. Pet. App. 6a; *see also* Jt. Exh. 205, Tr. 364, 368; Jt. Exh 206, Tr. 364, 368. In the same year, it facilitated formation of the White River Ad Hoc Work Group, which was composed of a variety of stakeholders having land interests along the White and Black Rivers, and asked the group to propose permanent changes to the approved plan. Pet. App. 6a. Because the work group could not reach a consensus on a permanent deviation plan, the Corps continued to impose a series of deviations. Pet. App. 8a. The Corps promoted formation of a work group subcommittee of only Black River interests in 1996, but that subcommittee also failed to garner unanimous approval for any permanent deviation plan. Pet. App. 8a, 50a. Meanwhile, the Corps continued to deviate from the authorized water control plan. *See* Pet. App. 48a; J.A. 349 (1999 memo noting that "the lake has been operating under an authorized deviation, as nearly as can be determined, since 1993"). In 1999, it finally began a formal process for adopting its deviations as a permanent revision to the Clearwater Lake Water Control Manual. Pet. App. 9a, 51a; J.A. 58-59, 350.

The Court of Federal Claims described the Corps' actions during this period as a "series of deviations" that resulted in a unique "pattern" of increased flooding on the Management Area. Pet. App. 48a, 107a; *see also* Pet. App. 89a (explaining that the deviations were not "isolated invasions that might merely constitute a tort"). Although lower in volume, the releases from Clearwater Dam under each of the deviations were more sustained and occurred throughout the spring and summer. J.A. 438-39. Compared to the approved water control plan, they caused higher water levels for longer durations in the

river below Poplar Bluff and six consecutive years of prolonged flooding on the Management Area during the critical growing seasons. J.A. 439; *see also* Pet. App. 14a ("With respect to the substantiality of the flooding, the Commission's testimony showed that the Management Area flooded regularly during the 1993-2000 period, including during the tree growing season."); J.A. 83-84. In each year of increased flooding, bottomland hardwood soil remained saturated throughout much of the year. J.A. 439. These conditions ultimately resulted in extensive destruction of the Commission's timber on the Management Area and severely degraded the natural bottomland hardwood habitat. J.A. 376-77, 381-87, 439; *see also infra* at 10-15 (describing biological process and extent of damage).

In 2001, the Corps finally ceased its deviations and abandoned its efforts to permanently alter the water control plan, but only after—at the Commission's insistence—the Corps had performed water stage testing in the Black River in the vicinity of the Management Area. *See* Pet. App. 15a-16a. The Commission and other interest groups, including the United States Fish and Wildlife Service, the Missouri Department of Conservation, dock owners and campsite operators at Clearwater Lake, and drainage district members, had previously expressed numerous, strong objections to the Corps' deviations. J.A. 59-62. The Commission had complained repeatedly to the Corps that the Management Area was experiencing sustained flooding during the growing season due to the Corps' deviations. J.A. 60-62, 399-407; *see also* Pet. App. 7a, 15a, 49a, 98-99a. The Commission specifically forewarned that the deviations would be detrimental to the biological integrity of the area

because sustained, growing season flooding is extremely harmful to bottomland oak species such as nuttall, willow, and overcup oak. J.A. 404-11. It characterized the new flooding regime as "clearly unacceptable to our management goals" and urged the Corps to return to the original water control plan. J.A. 415; *see also* Pet. App. 50a. The other groups voiced similar concerns about the welfare of the bottomland hardwood forest in the Management Area being affected by the flooding. *See, e.g.*, J.A. 63-66. Even more urgent objections were provoked from the Commission and other interested parties after the Corps moved forward with adopting permanent revisions to the Clearwater Lake Water Control Manual and issued a draft environmental assessment finding that the flooding had "no significant impact" on the Management Area. *See* J.A. 71-72, 348-60; *see also* Pet. App. 51a-52a.

Only the water-stage testing finally performed in 2001 convinced the Corps that its deviations had a "clear potential for damage" to bottomland hardwoods in the Management Area. Pet. App. 15a-16a. The Corps issued a revised environmental site assessment at that time, admitting that its temporary flooding regime had "the potential for significant impacts on the natural or cultural resources present" and that "extended inundation could result in adverse impacts to species composition and habitat deterioration." J.A. 726. Colonel Thomas Holden (United States Army Corps of Engineers, Little Rock District) acknowledged that the Commission's objections had been valid and advised that "anyone could challenge us in that [the] deviations are not in compliance with [the National Environmental Policy Act of 1969] and enjoin us.

Blissful ignorance of the preceding 25+ years no longer applies." Pet. App. 186a, 188a.

C. The Substantial Damage Caused by the Corps of Engineers' Deviations

Bottomland hardwood forest ecosystems are accustomed to wintertime flooding when the water is cold and well-oxygenated. J.A. 111. However, if the flooding regimes are altered, these communities will shift to either a wetter or drier type tree species composition. J.A. 454. In particular, prolonged flooding and soil saturation during the growing season will cause less water-tolerant species, such as various oaks, to die and be replaced by more water-tolerant species. J.A. 454, 456. In some low elevation sites, communities can shift entirely from bottomland hardwood forest to a "swamp condition" characterized by invasive wetland species, like buttonbush, smartweed, lizard tail, cypress seedlings, and black willow, that prevent oak regeneration. J.A. 100-01, 113-14. This occurs because bottomland hardwood timber cannot effectively metabolize sugars if subjected to consecutive years of summertime flooding.

Through the process of photosynthesis, trees are able to extract carbon dioxide from the atmosphere and use solar energy to convert it into carbohydrates or sugars. J.A. 109-10. Respiration—the reverse chemical process—requires oxygen to convert the sugars back into carbon dioxide and water which releases stored chemical energy. J.A. 110. This energy is required for metabolic processes in the trees, including photosynthesis, transpiration, respiration, and growth. J.A. 112. If flooding occurs during the hot summer months, the dissolved oxygen in saturated

soils escapes into the atmosphere. J.A. 111-12. At a certain level, the loss of oxygen from the water and soil medium will force trees to switch to anaerobic respiration to survive. J.A. 112. Toxic chemicals produced as byproducts of anaerobic respiration can kill the fine tree roots where carbohydrates are stored and cause drastic reduction of tree root mass over time. J.A. 110. Root system loss combined with a lack of adequate energy production can ultimately result in tree death. J.A. 112.

The timber species found in bottomland hardwood forests cannot tolerate multiple successive years of anaerobic conditions. J.A. 110-11. For example, nuttall oaks may be able to survive flooding during a single growing season, but not over the course of three or more growing seasons. J.A. 112. Similarly, overcup oaks cannot tolerate four or five years of anaerobic conditions. J.A. 112-113. The United States' bottomland hardwood expert, Dr. Sammy King ("Dr. King"), agreed that the cumulative impacts of multiple years of growing season flooding can result in the death of nuttall and overcup oaks. J.A. 331-32. In contrast, wetland species like buttonbush, lizard tail, and smartweed have special metabolic pathways that allow them to thrive in such conditions. J.A. 111.

The Corps' deviations resulted in multiple consecutive years of what Dr. King characterized as "extreme" flooding because it lasted longer than was contemplated under the original water control plan and occurred during some of the hottest months. J.A. 338-42. Actual observed data demonstrated that there was a very significant and unique change in the number of days that the Black River was above levels that would cause flooding on the Management Area.

J.A. 121-24, 174, 425-33, 449-51, 467-75, 479-80; *see also* Pet. App. 88a-89a ("Water-level gauge data from Corning, located just upstream of the Management Area, provide explicit evidence in this regard."); Pet. App. 105a-114a (finding the Commission's data "reliable evidence" that the Management Area begins to flood when the Corning gauge reaches 4.5 to 5 feet and that extensive flooding occurs when it reaches 6 feet and rejecting the government's modeling as "far from unassailable" and as relying on a "faulty assumption" regarding drainage levels). Floodwaters often could not drain from oak stands until mid- to late-August. J.A. 379, 472-73; *see also* Pet. App. 89a; J.A. 83-84. As a result, soils on much of the Management Area remained saturated for 10 to 11 months of the year—and, most importantly, for the six-month growing season from April through September. J.A. 379, 473. However, there was no statistical difference in precipitation data between the pre- and post-deviation periods. J.A. 124, 178-80.

As described by Dr. King, the flooding on the Management Area took place during some of the hottest months of the year and led to increased tree stress because of reduced oxygen. J.A. 342. He agreed that this flooding followed by a drought period that occurred in 2000 caused timber mortality on the Management Area. J.A. 343; *see also* Pet. App. 14a, 122a-126a; J.A. 115-16. A wet period followed by drought can lead to acute mortality because the trees have lost many of their smaller feeder roots and simply can no longer absorb the resources necessary to sustain themselves during the drought. J.A. 332-33; *see also* Tr. 2443-2444 (explaining that the drought itself was only "moderate" and would not have killed the trees if they had not been subjected to flooding

from the deviations, as demonstrated by control stands not subject to the Corps' flooding that survived the drought).

Dr. Mickey Heitmeyer, an expert in bottomland hardwood ecology, explained that the type and level of flooding that plagued the Management Area from 1993 to 2000 was "a unique event that had never happened before." J.A. 174-75; *see also* J.A. 83-84. Illustrating the importance of this distinction and its correlation to the extensive timber death and destruction experienced on the Management Area following the Corps' deviations, he expounded that bottomland hardwood forest "is not adapted to six consecutive years of prolonged flooding. It is adapted to periodic flooding. It is adapted to annual flooding at certain times. It is adapted on occasion to growing-season flooding. But it is not adapted to six consecutive years of this level of flooding." J.A. 175.

Prior to when the Corps began deviating from the approved water control plan in 1993, the Management Area was fairly typical riverine, bottomland hardwood forest occupied by nuttall and overcup oaks that were mostly between 70 and 100 years old. J.A. 113. In "stark contrast" to this "beautiful," "stunning," and "healthy" forest, many trees in the Management Area were "browned-out" and appeared dead by 1999. J.A. 73-75, 97-98; *compare* J.A. 487 (1983 aerial photograph) *with* J.A. 347 (2000 aerial photograph); *see also* Pet. App. 53a-54a, 119-120a; Tr. 61-64 (describing "a drastic decline in the overall quality and health of the forest over a large portion of the area"). There was hardly any overstory left in some areas. J.A. 83. Instead, new openings pierced the once largely-closed canopy, and oak trees were replaced by

abundant buttonbush and other invasive, undesirable, water-tolerant species that precluded new trees from taking hold. J.A. 76, 83, 99-100, 113-14. In 2000, the Management Area was "a bottomland hardwood ecosystem in a state of collapse." J.A. 113. Most of the nuttall oaks, red oaks, and sweetgum were either dead or dying. J.A. 113-14. By 2005, extensive areas had reached a "tipping point"—meaning that invasive, undesirable wetland species had progressed to a point where they would inhibit or prevent any degree of natural regeneration of these desirable species. J.A. 100-01.

A timber survey conducted in January 2001 confirmed that approximately 6,990 acres of the Management Area were in a rapid state of decline and degradation. J.A. 376-77, 381-82, 385-89. The survey observed excessive mortality in all tracts surveyed except for two control stands that were not subject to the Corps' flooding. J.A. 384. Outside the control stands, mortality in oaks and gums ranged from 15-60%. J.A. 384; *see also* J.A. 383 (mortality in the control stands was less than 2%). Roughly 30-40% of the trees that were not dead showed severe die-back in the crowns. J.A. 384. Before the Corps' deviations, in contrast, average mortality and dieback was only about 1-2%. J.A. 385. The damage to the Management Area was initially estimated to exceed $4.7 million. J.A. 377, 390-98. This appraisal was increased by $1.9 million after a second timber cruise conducted in December 2001 identified an additional 11,633 acres that, while not as severely damaged as the initial study area, clearly had tree mortality and tree decline well above normal background levels. J.A. 362-72. Because bottomland hardwoods like nuttall oak were unlikely to regenerate naturally after

undesirable wetland species invaded the Management Area, a restoration program was recommended for the original 6,990-acre survey area that was projected to cost the Commission between $5 million and $5.7 million. J.A. 416-24; *see also* Tr. 999-1000, 1630; Pl. Exh. 501, Tr. 1000.

D. The Trial Court's Award of Just Compensation

Following a two-week trial that included eighteen witnesses, a site visit, pre- and post-trial briefing, and post-trial argument, the Court of Federal Claims (Judge Charles F. Lettow) found that it was "evident" that the Corps had taken the Commission's property "as demonstrated by water gauge levels from 1993 to 1999 indicating higher-than-normal levels in the river, and evidence concerning the Corps of Engineers' deviations from the original water control plan from 1993 to 2000 indicating higher-than-originally-planned releases of water into the river." Pet. App. 85a-86a. Though not the full amount of damages sought, the court held that the Commission was entitled to just compensation from the United States totaling $5,602,329.56 for timber lost and destroyed and $176,428.34 for a regeneration program to address areas severely affected by invasive wetland species. Pet. App. 161a.

Detailed and extensive fact finding supports the Court of Federal Claims' conclusion and timber damages award. The court first determined that evidence presented at trial shows that "the government's superinduced flows so profoundly disrupted certain regions of the Management Area that the Commission could no longer use those regions

for their intended purposes, *i.e.*, providing habitat for wildlife and timber for harvest." Pet. App. 91a-92a. The court explained, during moderate drought years in 1999 and 2000, a "relatively sudden collapse" occurred because persistent flooding and saturated soil during the growing seasons damaged root systems to the point the trees were unable to support themselves. Pet. App. 91a. It found testimony of one of the government's own experts, Dr. King, to be "the most dramatic" given that he acknowledged that the Corps' deviations resulted in "substantial additional flooding" and agreed the flooding lasted longer than would have occurred under the original, authorized plan. Pet. App. 111a. The court concluded, "[i]n short, evidence put forward by the Commission and admissions by the Corps of Engineers indicate the significant impact of flooding on the bottomland hardwood timber in the Management Area." Pet. App. 124a. It described the damage as "catastrophic mortality and loss." Pet. App. 124a; *see also* Pet. App. 122a-123a, 128a.

The court additionally found that "the effect of deviations in the Management Area was predictable, using readily available resources and hydrologic skills." Pet. App. 99a. It observed that "the Corps of Engineers had been repeatedly warned by members of the Commission that the ongoing deviations were causing flooding in the Management Area that could potentially damage the bottomland hardwood trees owned by the Commission." Pet. App. 98a. Further, the Corps would have been able to predict both that the deviations would increase flooding on the Management Area and that the flooding would cause timber damage if it had performed "a reasonable investigation of the effects the deviations would have on downstream water levels." Pet. App. 99a. In fact,

a computerized modeling program was available to the Corps that could have been used to evaluate the potential effects of its deviations from the approved water control plan. Pet. App. 99a. After rejecting various intervening causes alleged by the government, the court resolved that the government "set [a] chain of events into motion through authorized deviations from the water control plan" that formed a "direct, natural, and probable path" to the significant growing season flooding experienced on the Management Area. Pet. App. 101a-102a. It held that it was consequently "evident that the distinguishing factor producing the excessive mortality in 1999 and 2000 was the trees' roots' inability to withstand the moderate drought in those years after the extensive damage they suffered during the floods from 1993 to 1999." Pet. App. 128a.

E. The Federal Circuit's Fractured Reversal and Denial of Panel Rehearing and Rehearing *En Banc*

On appeal by the government, a divided Federal Circuit panel (2-1) reversed the damages awarded to the Commission without considering the extensive factual findings made by the Court of Federal Claims. The panel majority reasoned that it "need not decide whether the flooding on the Management Area was sufficiently substantial to justify a takings remedy or the predictable result of the government's action, because the deviations were by their very nature temporary and, therefore, cannot be inevitably recurring or constitute the taking of a flowage easement." Pet. App. 22a (internal quotes omitted); *see also* Pet. App. 14a (acknowledging "[w]ith respect to the substantiality of the flooding, the Commission's testimony showed that the Management Area was

flooded regularly during the 1993-2000 period, including during the tree growing season"). It reached this conclusion despite recognizing the well-established principle that "if a particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim." Pet. App. 18a (citing *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304, 328 (1987)). The panel majority justified its reversal of the Court of Federal Claims' judgment in favor of the Commission by stating that "cases involving flooding and flowage easements are different." Pet. App. 18a.

In her dissent, Judge Newman strongly disagrees with this distinction and characterizes the Federal Circuit's ruling as "contradict[ing] the entire body of precedent relating to the application of the Fifth Amendment to government-induced flooding." Pet. App. 37a. She explains that all cases involving temporary government invasions—including flooding cases—are subject to a "complex balancing process." Pet. App. 32a (citing *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 436 n.12 (1982)). "Precedent does not require constant or permanent flooding, and eventual abatement of the flooding does not defeat entitlement to just compensation; the specific facts must be considered, as for any invasion of property." Pet. App. 33a (collecting Supreme Court and Federal Circuit cases). In Judge Newman's view, "[p]recedent recognizes that flood-induced destruction of timber is a permanent injury, and is compensable under the Fifth Amendment." Pet. App. 35a (citing *Cooper v. United States*, 827 F.2d 762 (Fed. Cir. 1987)). Accordingly, she warns that the panel majority's focus on the temporal aspect of the

government's intrusion to the exclusion of other relevant factors is error. Pet. App. 37a. She identifies the correct question as asking "whether the increased flooding caused significant injury before the flooding was abated, such that, on balance, the Fifth Amendment requires just compensation." Pet. App. 36a.

Despite these strongly differing opinions, the Federal Circuit denied the Commission's request for *en banc* rehearing and also denied panel rehearing in another markedly divided decision (7-4). No majority opinion was issued. Instead, the only opinion that supports the rehearing denial is a concurrence by Judge Dyk, joined by Judges Gajarsa and Linn. Specifically, Judge Dyk states, "the panel majority did not create a blanket rule under which any flood-causing policy that is labeled temporary by the government will allow the United States to avoid takings liability." Pet. App. 168a. He identifies the government's intent not to implement a permanent policy as the decisive factor. Pet. App. 168. He then acknowledges that fifty consecutive and identical one-year deviations might support finding that a taking has occurred if the government adopted them with the intent to create a permanent or recurring condition. Pet. App. 169a.

Two dissents were written in response to this concurrence and the Federal Circuit's denial of any form of rehearing. In one, Judge Newman reiterates that the panel majority's new rule that an injury caused by temporary flooding cannot be a taking is "contrary to law and precedent." Pet. App. 178a. With respect to Judge Dyk's statement that no *per se* rule was created in the panel decision he authored, she

responds that "a single judge cannot rewrite the words and change the ruling of the court's issued opinion. If anything, such an attempted qualification adds confusion, not clarity, to this precedential decision." Pet. App. 179a. Judge Newman adds that the panel majority also improperly created a new rule that it is not necessary to apply the proper balancing test when determining if the government's actions effected a taking. Pet. App. 178.

In a second dissent, Judge Moore, joined by Judges O'Malley and Reyna, agrees with Judge Newman that the panel majority's reversal relied on "a rigid, unworkable and inappropriate black letter rule." Pet. App. 176a. She points out that allowing the "temporary" label for the Corps' deviations to control the takings analysis "elevates form over substance and leads to untenable results with enormous future consequences." Pet. App. 171a. The takings inquiry instead "'requires consideration of whether the effects . . . experienced were the predictable result of the government's action, and whether the government's actions were sufficiently substantial to justify a takings remedy.'" Pet. App. 171a (quoting *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003)); *see also* Pet. App. 176a. In contrast to Judge Dyk's fifty-year deviation hypothetical, Judge Moore queries: "If a flowage easement which is terminated after eight years can be a compensable taking, why can't an eight year flowage easement or eight consecutive one year flowage easements?" Pet. App. 174a. She answers, "With all due respect, the question of whether eight years of deviations are similarly adequate is best left to the fact finder – the Court of Federal Claims." Pet. App. 174a-175a.

SUMMARY OF THE ARGUMENT

This case presents the question of whether the government can take property for public use through temporary flood invasions. It has been the rule until now that if the government must pay when it permanently uses a property, it must also pay when its temporary use substantially intrudes upon that property. The Federal Circuit nonetheless announced a new categorical legal rule that temporary flood invasions are exempt from the Takings Clause. Because the Federal Circuit's permanency rule was outcome determinative in the Commission's case and cannot stand, this Court should reverse and remand for the Court of Appeals to apply the established physical takings analysis.

Ia. Government action that amounts to a physical invasion is the most direct means of taking property for public use. When the government takes actions that directly, naturally, or probably result in physical invasions that substantially intrude on a protected property interest, this Court has invariably awarded just compensation regardless of the particular mode of invasion. While permanent and exclusive occupations are substantial intrusions in all circumstances, the question with other direct physical invasions is whether the intrusion is, on balance, substantial. Courts should consider all the circumstances of the government's invasions before rejecting any physical takings claim.

b. As this Court has had more occasions to address the different ways in which governments can press property into public service, it has clarified that even temporary public use is compensable. In holding

that temporary physical invasions can take property, this Court has recognized that such invasions can intrude in ways that permanent invasions may not. The government may, of course, take a limited interest but it must pay for what it takes, even if it abandons the interest or uses it only for a limited time.

c. When the government's mode of invasion is flooding, its invasions are subject to the same constitutional analysis as for all other types of physical invasions. Despite clear case holdings that temporary physical invasions are compensable and that floods are physical invasions subject to the same analysis as other physical invasions, the Federal Circuit concluded that temporary flood invasions are exempt from the Takings Clause. This categorical permanency requirement arises from a fundamental misunderstanding of isolated dicta from early flooding cases. This Court's later takings cases squarely refute the idea that permanency is a mandatory requirement in any takings case, and, in any event, those dicta never actually stood for the categorical requirement applied here by the Federal Circuit.

IIa. The Federal Circuit's unprecedented exception for temporary flood invasions conflicts with the bedrock principle that it is the owner's loss, not the taker's gain, that defines a taking. Viewing the situation entirely from the government's perspective, the Federal Circuit treated each of the six years of consecutive flood invasions as isolated events and hinged the government's potential for liability on its subjective intent, *i.e.*, whether it intended to flood the Commission's property permanently. The court considered only its new categorical permanency requirement and never considered how much damage

the United States' flooding actions caused or how much it preempted the Commission's use and enjoyment of its property. Here, the Commission's loss is massive and permanent, and the Corps' flood invasions substantially preempted the use and enjoyment of the Commission's property maintained as an important wildlife habitat. When the takings question is approached from the landowner's perspective, as it should be, it is apparent that these flood invasions pressed the property into public use even though the government eventually ended its invasive actions.

b. The Federal Circuit's categorical permanency requirement for flood cases is manifestly unfair. If the government takes an action, the direct, natural, or probable result of which is a physical invasion that substantially intrudes on a protected property interest, there is no justification for withholding payment of just compensation simply because it limits the duration of its invasion. While the government may deliberately shift burdens to one owner to benefit others, the Takings Clause mandates that just compensation be made to the one whose property is taken. This is no less true when the invasion is limited in duration.

ARGUMENT

I. The Takings Clause Analysis Applies Uniformly To All Physical Invasions Including Temporary Flood Invasions.

The Fifth Amendment Takings Clause's "guarantee that private property shall not be taken for a public use without just compensation was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960).[1] The pivotal question under the Takings Clause is whether the government has in fact put property to public use so as to require just compensation. Over the years, a number of artificial distinctions protecting the government have risen and then, as decisions exposed their inherent unfairness, fallen away. This case presents the rise of another such unfair, artificial distinction that permanent flood invasions *are* compensable under the Takings Clause while temporary flood invasions *are not*. No physical invasion is exempt from the Takings Clause solely for lack of permanency. If the government presses private property into public service, the public must pay for its

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[1] Just as it guarantees protection of private property of citizens, the Takings Clause protects the property of States and their subdivisions from appropriation by the Federal Government without "just compensation." *United States v. Carmack*, 329 U.S. 230, 241-42 (1946); *cf. California v. United States*, 395 F.2d 261, 263-64 & n.4-5 (9th Cir. 1968) (holding that the Fifth Amendment protects property from appropriation without just compensation "even when the property has been dedicated by the State to public use").

use. "Of course, payment need only be made for what is taken, but for all that the Government takes it must pay." *United States v. Dickinson*, 331 U.S. 745, 750 (1947). This is true even if that use is temporary. *Id.*

A. The government takes property for public use when its direct physical invasions substantially intrude on a protected property interest.

Government action that amounts to a physical invasion is the most direct means of taking property for public use. *E.g.*, *Loretto*, 458 U.S. at 438-39; *Kaiser Aetna v. United States*, 444 U.S. 164, 179-80 (1979); *United States v. Causby*, 328 U.S. 256, 265-66 (1946); *United States v. Cress*, 243 U.S. 316, 327-28 (1917). All physical invasions inflict injury because they tangibly subordinate the property owner who cannot eject the government. *See Loretto*, 458 U.S. at 436 (explaining that a physical invasion or occupation is "qualitatively more severe than a regulation of the *use* of property, since the owner may have no control over the timing, extent, or nature of the invasion").

The fundamental difference between physical invasions and regulatory interferences can be seen by comparing *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 535 U.S. 302, 306 (2002), with *United States v. General Motors Corp.*, 323 U.S. 373, 380 (1945). In *Tahoe-Sierra*, regulators imposed temporary moratoria on land development, intending to "maintain the status quo." 535 U.S. at 306. Regarding the moratoria at issue, the district court had found that no plaintiff offered specific evidence of an injury. *See id.* at 314 n.8, 315 & n.11. Whereas in *General Motors*, this Court recognized that

when the government asserts the right to physically occupy for even one day, even if it does not actually occupy, it inflicts an injury. 323 U.S. at 380; *see also Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978) ("A 'taking' may more readily be found when the interference with property can be characterized as a physical invasion by government than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good.") (internal citations omitted).

In assessing whether the government has taken property through physical invasions, the inquiry has long involved an inherent balancing process. This process, though, is not standardless. *See Loretto*, 458 U.S. at 427. Over the years, this Court's decisions have made clear that direct invasions that substantially intrude on another's property interest invariably require just compensation. *E.g.*, *id.* at 427, 438, 441 (concluding that cable installation involving direct physical attachment of plates, boxes, wires, bolts, and screws to a building for an indefinite period met the traditional test in which "this Court has invariably found a taking" because "the character of the invasion is qualitatively more intrusive than perhaps any other category of property regulation"); *see also Causby*, 328 U.S. at 265.

Harmonizing the litany of takings cases, Judge Newman below described the takings analysis that the Federal Circuit should have applied in this case. Undisturbed by the panel majority were the Court of Federal Claims' findings that the Corps of Engineers' flood invasions were objectively foreseeable as the direct, natural, and probable result of the deviations.

See Pet. App. 99a (finding that the Corps "would have been able to predict both that the deviations would increase the levels of the Black River in the Management Area and that the flooding caused by these increased levels would damage timber in the Management Area" if it had performed a "reasonable investigation" of the downstream effects of its deviations). When the invasion is foreseeable as the direct, natural, or probable result of government action, the question is whether the intrusion is, on balance, substantial such that the Takings Clause requires just compensation. *Cf.* Pet. App. 36a (Newman, J., dissenting). The Federal Circuit's foreseeability analysis, developed over the years and applied by the Court of Federal Claims below, is an objective and factual one serving to differentiate between incidental damages and the kind of direct invasions that physical takings so often illustrate. *See, e.g.*, *Moden v. United States*, 404 F.3d 1335, 1343 (Fed. Cir. 2005); *see also Bettini v. United States*, 4 Cl. Ct. 755, 760 (1984).

Loretto, for example, involved a direct physical invasion at the hands of the government. *See* 458 U.S. at 438. There the issue was whether cable equipment installed on a building constituted a taking. *Id.* at 426. A New York statute directed "that a landlord must permit a cable television company to install its cable facilities upon his property," and the equipment could remain indefinitely, "[s]o long as the property remains residential and a [cable] company wishes to retain the installation." *See id.* at 421-22, 439 & n.17. This Court held that the equipment—installed and retained by a private party pursuant to a legislative grant of authority—effected a taking "without regard to whether the action achieves an important public

benefit or has only minimal economic impact on the owner." *Id.* at 434-35. The rule from *Loretto* is that when such an invasion is permanent or indefinite, it is such a substantial intrusion that it constitutes a taking in all circumstances. *See id.* at 441.

Courts have similarly held that the complete destruction of an owner's entire interest constitutes an intrusion commanding just compensation. *See, e.g.*, *General Motors*, 323 U.S. at 384 ("And it matters not whether they were taken over by the Government or destroyed, since, as has been said, destruction is tantamount to a taking."); *United States v. Welch*, 217 U.S. 333, 339 (1910) ("But if it were only destroyed and ended, a destruction for public purposes may as well be a taking as would be an appropriation for the same end."); *see also Armstrong*, 364 U.S. at 48 ("The total destruction by the Government of all value of these liens, which constitute compensable property, has every possible element of a Fifth Amendment 'taking' and is not a mere 'consequential incidence' of a valid regulatory measure.").

But neither destruction nor permanent occupation is necessary to justify compensation. *Causby*, 328 U.S. at 267-68; *see also General Motors*, 323 U.S. at 378 ("Governmental action short of acquisition of title or occupancy has been held, if its effects are so complete as to deprive the owner of all or most of his interest in the subject matter, to amount to a taking."). In *Causby*, the question was whether a taking was effected by a one-year airport lease with six-month renewals (beginning in 1942) that led to navy aircraft overflights at low altitudes. 328 U.S. at 258. The overflights prevented the owner's continued use of the property as a commercial chicken farm. *See id.* at 259,

262. On those facts, this Court agreed "that a servitude ha[d] been imposed upon the land." *Id.* at 267. "[T]he land [was] appropriated as directly and completely as if it were used for the runways themselves," and it was immaterial that the property might still be used for something else. *Id.* at 262 (observing "no material difference" when use and enjoyment is not completely destroyed, because airplane overflights "might reduce . . . an orchard to a vegetable patch," so that while "[s]ome value would remain," the overflights "would limit the utility of the land and cause a diminution in its value"); *see also Kaiser Aetna*, 444 U.S. at 180 ("[E]ven if the Government physically invades only an easement in property, it must nonetheless pay just compensation."); *Portsmouth Harbor Land & Hotel Co. v. United States*, 260 U.S. 327, 329-30 (1922) (concluding that landowner stated sufficient specific facts to warrant a finding that a servitude had been imposed on allegations that the United States erected a fort nearby, established a battery of heavy coast defense guns there, and fired those guns over petitioner's land).

Though not every physical invasion linked to the government will result in a substantial intrusion, the courts should consider all relevant factors before summarily rejecting a physical takings claim. Additional factors weighing in favor of just compensation include:

- Whether the government injures an interest in property through actions that only the government could take. *See Armstrong*, 364 U.S. at 48 ("It was because the Government for its own advantage destroyed the value of the

liens, something that the Government could do because its property was not subject to suit, but which no private purchaser could have done.");

- Whether the owner objected to the government's invasions and the government nonetheless continued its actions. *United States v. Archer*, 241 U.S. 119, 131 (1916); *see also id.* at 143-44 (Pitney, J., dissenting); or

- Whether the government can argue that its interference is compelled by an exigent circumstance like war. *See, e.g.*, *United States v. Central Eureka Mining Co.*, 357 U.S. 155, 168 (1958).

Here, the Court of Federal Claims specifically found that the government's actions had foreseeably caused substantial damage to the Commission's timber and habitat. *See* Pet. App. 99a ("In short, the effect of deviations in the Management Area was predictable, using readily available resources and hydrologic skills."); Pet. App. 111a (citing the United States' own expert testimony that "[t]he Corps's deviations resulted in substantial additional flooding on the [Management Area]"); Pet. App. 122a-123a (finding that the Commission offered "significant and persuasive evidence" linking the Corps' deviations and "resulting catastrophic mortality in the sections of the Management Area that were subject to flooding and saturated soils during the growing seasons from 1993 to 2000"); *see also* Pet. App. 88a, 91a-93a, 98a-102a, 107a-126a. Indeed, if the United States had simply come and looked during its deviations it would have seen the flooding it caused. *See* Pet. App. 99a. The Commission and other interest groups even specifically

warned the Corps about the impending damage to the Commission's property. *See* Pet. App. 7a, 15a, 49a-52a, 98a-99a; *see also* J.A. 59-66, 399-411, 415. Nevertheless, the Corps moved forward to make permanent the water release changes in the Clearwater Lake Water Control Manual. *See* Pet. App. 51a-52a; *see also* J.A. 348-60.

The Federal Circuit did not dispute any of those facts. *E.g.*, Pet. App. 14a ("With respect to the substantiality of the flooding, the Commission's testimony showed that the Management Area was flooded regularly during the 1993-2000 period, including during the tree growing season."); *see also* Pet. App. 36a (Newman, J., dissenting), 172a (Moore, J., et al., dissenting from denial of rehearing). It simply deemed them irrelevant. Pet. App. 22a (holding that it "need not decide whether the flooding on the Management Area was 'sufficiently substantial to justify a takings remedy' or 'the predictable result of the government's action,' because the deviations were by their very nature temporary") (internal citations omitted). This was error. The Corps' actions that foreseeably resulted in substantial flood invasions that killed or degraded more than 18 million board feet of important timber resources effected a taking of the Commission's property on those grounds alone. Before the Federal Circuit categorically rejected the possibility of a taking, it should have considered *all* the circumstances of the government's invasions as found by the Court of Federal Claims.

B. Temporary physical invasions, which can intrude in ways that permanent invasions do not, can take property for public use.

Justice Brennan once observed: "Nothing in the Just Compensation Clause suggests that 'takings' must be permanent and irrevocable." *San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 657-58 (1981) (Brennan, J., et al., dissenting).[2] Over time, as this Court has had occasion to examine more of the ways in which governments use private property, its decisions have more clearly articulated the rule that temporary use is compensable. *See, e.g., Kimball Laundry Co. v. United States*, 338 U.S. 1, 12-14 (1949); *General Motors*, 323 U.S. at 382-83; *see also First English*, 482 U.S. at 319. In *First English*, Los Angeles County had imposed a land use regulation which the landowner alleged denied it all use of its land; however, the county argued it owed no compensation for the period of a "temporary taking" before the measure was declared unconstitutional. *Id.* at 308-09. This Court addressed whether the Takings Clause requires the government to pay for "temporary" regulatory takings. Ultimately answering in the affirmative, the Court reviewed its earlier decisions where the government had "only temporarily exercised its right to use private property." *Id.* at 318 (citing *United States v. Dow*, 357 U.S. 17, 26 (1958); *Kimball Laundry*, 338 U.S. 1; *United States v. Petty Motor Co.*, 327 U.S. 372, 375 (1946); *General Motors*, 323 U.S.

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[2] Justice Brennan, with Justices Stewart, Marshall, and Powell, discussed the merits of a takings claim not reached by the majority. *San Diego Gas & Elec. Co.*, 450 U.S. at 646.

373). The Court concluded that "temporary" takings which deny all use of property "are not different in kind from permanent takings, for which the Constitution clearly requires compensation." *Id.* at 318. Where an action amounts to a temporary taking, the government is required to pay for the use of the land during that period. *Id.* at 319.

More recently, in *Tahoe-Sierra*, this Court considered whether a government agency's temporary moratoria on development effected unconstitutional regulatory takings of property. 535 U.S. 302. While contrasting differences between physical takings and regulatory takings, the Court explained that physical invasions generally must be compensated regardless of whether the particular land interest taken constitutes an entire parcel or just a part thereof, and even though the invasion is temporary. *Id.* at 322 (citing *United States v. Pewee Coal Co.*, 341 U.S. 114, 115 (1951); *Petty Motor Co.*, 327 U.S. 372; *General Motors*, 323 U.S. at 373). It is clear, therefore, that once an invasion brings about a taking of property, "no subsequent action by the government can relieve it of the duty to provide compensation for the period during which the taking was effective." *First English*, 482 U.S. at 321.

The government may, of course, take a limited interest. *E.g.*, *United States v. Virginia Elec. & Power Co.*, 365 U.S. 624, 627 (1961) (holding that a flowage easement is an interest in property and the government's destruction of such "would ordinarily constitute a taking of property within the meaning of the Fifth Amendment"). But it must pay for what it takes even if it abandons that interest or takes it for only a limited duration. *First English*, 482 U.S. at

321; *Dow*, 357 U.S. at 26; *Dickinson*, 331 U.S. at 750; *Causby*, 328 U.S. at 267-68 (agreeing that a servitude was imposed regardless of whether the government intended to continue its actions, and remanding to determine for compensation whether the easement was permanent or temporary).[3] As the Federal Circuit itself previously said:

> [T]he government when it has taken property by physical occupation could subsequently decide to return the property to its owner, or otherwise release its interest in the property. Yet no one would argue that that would somehow absolve the government of its liability for a taking during the time the property was denied to the property owner. All takings are "temporary," in the sense that the government can always change its mind at a later time, and this is true whether the property interest taken is a possessory estate for years or a fee simple acquired through condemnation, or an easement of use by virtue of regulation. The long drawn out battle of *Agins/San Diego Gas/First Lutheran Church* was not a fight over principle, but a dispute over the illogical use of a word.

Hendler v. United States, 952 F.2d 1364, 1376 (Fed. Cir. 1991).

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[3] *Accord Kimball Laundry*, 338 U.S. at 13; *General Motors*, 323 U.S. at 382-83; *see also Hendler*, 952 F.2d at 1376; *United States v. Muniz*, 540 F.3d 310, 312 (5th Cir. 2008) (involving an express condemnation by the United States of a temporary easement); 33 C.F.R. § 211.1 (Corps of Engineers regulation defining "real estate" to include "rights-of-way or easements, whether temporary or permanent").

Indeed, temporary invasions can be even more injurious than permanent occupations. In *Kimball Laundry*, for example, the government temporarily used a private laundry during World War II. 338 U.S. at 3. Reasoning that the government's temporary use had put the owner in the difficult spot of being unable to start a new laundry because he faced the prospect of then having two properties to operate when the United States returned the first laundry, the Court approved additional damages for injury to business goodwill. *Id.* at 14. The reasoning is that if the government permanently condemns a property, the owner might at least start over somewhere else. But where the government puts the property to temporary use, the landowner is in a worse position and so additional damages are proper to ensure it receives just compensation. *Id.* at 15; *see also General Motors*, 323 U.S. at 382 ("It is altogether another matter when the Government does not take his entire interest, but by the form of its proceeding chops it into bits . . . ."); *Cooper*, 827 F.2d at 763 ("In addition, damages may be awarded under the Fifth Amendment for injuries from a temporary taking where the same injuries would not be compensable if a permanent taking occurred.").

C. When the government invades by flooding, its invasions are subject to the same Takings Clause analysis as any other physical invasion.

For more than a century, government-induced flood invasions have been recognized as physical invasions by which the government can put private property to public use. *See, e.g.*, *Pumpelly v. Green Bay Co.*, 80 U.S. (13 Wall.) 166, 181 (1871) (holding that "where real estate is actually invaded by superinduced

additions of water . . . so as to effectually destroy or impair its usefulness, it is a taking, within the meaning of the Constitution"); *accord United States v. Kansas City Life Ins. Co.*, 339 U.S. 799 (1950); *Dickinson*, 331 U.S. 745; *Jacobs v. United States*, 290 U.S. 13 (1933); *Cress*, 243 U.S. 316; *Welch*, 217 U.S. 333; *United States v. Lynah*, 188 U.S. 445 (1903). Like they do for any other physical invasion, courts award just compensation when the government takes actions that substantially intrude on a protected property interest through direct flood invasions. *See, e.g.*, *Cress*, 243 U.S. at 327-28 (awarding just compensation for a permanent condition of intermittent flood invasions, finding it "settled" that "overflowing lands by permanent backwater is a direct invasion, amounting to a taking," and reasoning that neither complete nor "almost complete destruction" was necessary because "it is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines the question whether it is a taking"); *see also Ridge Line, Inc.*, 346 F.3d at 1356 (describing the takings analysis for flood invasions as applying the Federal Circuit's foreseeability analysis and considering "the nature and magnitude of the government action").

Permanent and exclusive floods are permanent physical takings. *Lynah*, 188 U.S. at 469; *Pumpelly*, 80 U.S. at 177-78; *see also Loretto*, 458 U.S. at 428. Intermittent floods can likewise take property. *See Cress*, 243 U.S. at 328; *Cooper*, 827 F.2d at 763-64; *see also Loretto*, 458 U.S. at 436 n.12 ("As . . . the intermittent flood cases reveal, such temporary limitations are subject to a more complex balancing process to determine whether they are a taking."). It naturally follows that the government can take

property by increasing overflows on lands already subject to seasonal flooding. *See Jacobs,* 290 U.S. at 15; *see also Cooper*, 827 F.2d at 763-64; *Barnes v. United States*, 538 F.2d 865, 869, 873 (Ct. Cl. 1976). In *Jacobs,* where the United States built a dam that increased the already-occurring occasional overflows of the owner's lands, the Court observed—in addressing only the issue of whether interest should be part of a just compensation award—that "[a] servitude was created by reason of intermittent overflows which impaired the use of the lands for agricultural purposes." 290 U.S. at 16. It observed that the government had "contemplated the flowage of the lands, that damage would result therefrom, and that compensation would be payable." *Id.* The Court characterized this servitude as a "partial taking of the lands for which the government was bound to make just compensation under the Fifth Amendment." *Id.*

Despite clear holdings that temporary physical invasions are compensable, and that floods are physical invasions subject to the same analysis as other physical invasions, the panel majority below leaned heavily on dicta in older flooding cases like *Cress* and *Sanguinetti v. United States*, 264 U.S. 146 (1924), to conclude that temporary flood invasions are exempt from the Takings Clause. The confusion about permanency in flood cases stems from a misunderstanding of this Court's 1917 decision in *Cress* and a misuse of dicta in later cases citing it. *See Cress*, 243 U.S. at 328; *cf. Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 531 (2005) (describing in a different takings context how, "[o]n occasion, a would-be doctrinal rule or test finds its way into our case law through simple repetition of a phrase-however fortuitously coined"). The *Cress* decision—where the

phrase "inevitably recurring" first arose—only discussed inevitably recurring floods because the facts there presented them. *See Cress*, 243 U.S. at 328. On those facts, it unsurprisingly found a taking. *See id.* ("There is no difference of kind, but only of degree, between a permanent condition of continual overflow by backwater and a permanent liability to intermittent but inevitably recurring overflows . . . .").

Courts in later cases sometimes referenced the "inevitably recurring" floods language in *Cress* in ways that can be misconstrued as perceiving a categorical requirement. *See, e.g.*, *Fromme v. United States*, 412 F.2d 1192, 1197 (Ct. Cl. 1969) *cited in* Pet. App. 26a. But even if *Fromme*, for example, could be so distorted, the Court of Claims clarified that same year that permanency is *not* a required element. *See Nat'l By-Products, Inc. v. United States*, 405 F.2d 1256, 1273 (Ct. Cl. 1969) ("The distinction between 'permanent liability to intermittent but inevitably recurring overflows,' and occasional floods induced by government projects, which we have held not to be takings, is, of course, not a clear and definite guideline."). Because inverse condemnation claims arise from the Constitution, and thus are not judicially made common law claims, *Cress* does not bar recovery in cases like the Commission's involving flood invasions caused by temporary government actions. *Cf. Argent v. United States*, 124 F.3d 1277, 1282 (Fed. Cir. 1997) (noting that "while the facts, reasoning, and rules of [*United States v. Causby*] have always guided this corner of takings law, they do not imprison it" by "limit[ing] a takings claim to only those facts").

Indeed, the Federal Circuit itself previously found a taking on facts closely analogous to the situation

here In *Cooper*, the Federal Circuit addressed a 1979 construction blockage that increased the already-occurring seasonal flooding on bottomland timber while the Corps of Engineers tried to clear the blockage. 827 F.2d at 763-64. The Corps succeeded in clearing the blockage in 1984, but the additional growing-season flooding had killed the plaintiff's timber by then. *Id. Cooper* held that the government had taken the timber. *Id.* At a minimum, it plainly held that temporary government conditions that intermittently flood *can* take an owner's interest in timber. *Id.* at 763.

Occasions when courts declined to award compensation in flood cases generally involved at least a problem with causation or foreseeability, such as when flooding arose from an extreme rain event or where the actions conferred benefits greater than the injuries they inflicted. *See, e.g.*, *Sanguinetti*, 264 U.S. at 149; *Columbia Basin Orchard v. United States*, 132 F. Supp. 707, 711 (Ct. Cl. 1955) (finding the damage to trees was not the foreseeable result of government actions in drilling four miles from plaintiffs' spring that, in turn, hit water that ran into a lake along with unusually heavy snow runoff that caused an overflow of saltier water that, in turn, contaminated the spring from which plaintiffs irrigated with knowledge of the salty condition); *Fromme*, 412 F.2d at 1196 n.2 (observing that the government's new channel was "very beneficial to the plaintiff in connection with the development of an extensive and valuable deposit of sand and gravel in her land") *cited in* Pet. App. 34a-35a (Newman, J., dissenting).

Sanguinetti, for example, did not hold that a flood-based takings claim must fail if the government's

actions are "too temporary in nature" as the United States has suggested. *Compare* Br. Opp. 11 *with Sanguinetti*, 264 U.S. at 150. Although *Sanguinetti* did state that for flooding to take property it must "constitute an actual, permanent invasion of the land," that was not the only factor considered. *Id.* at 149. Rather, in concluding that the government did not take property through an over-engineered diversion canal that ultimately proved insufficient to handle record-setting rain events, *Sanguinetti* expressly noted that there were no findings of fact that a significant flooding intrusion was the foreseeable result of the government's canal design and construction. *Id.* at 149-50. The Court pointedly considered that the amount of permanent damage was not shown, the landowner had not lost the "customary use of the land" except for short periods of time, and the flooding was neither "the direct or necessary result of the structure" nor "within the contemplation of or reasonably to be anticipated by the government." *Id.*

In contrast to the several factors considered in *Sanguinetti*, the Federal Circuit here refused to consider anything but the duration of the government's actions because the panel majority deemed anything else irrelevant to its analysis. Br. Opp. 12-13(ii); *see also* Pet. App. 22a. Even the United States, as the appellant below, described the "correct question" as looking at more than just the duration of its invasions. *See* Pet. App. 192a-193a; *see also* Pet. App. 178a (Newman, J., dissenting from denial of rehearing).

If this Court's decisions in *General Motors*, *Causby*, and *Kimball Laundry*, which came after *Cress* and *Sanguinetti*, did not settle the issue, the idea that permanency is ever a threshold requirement in any

takings case should have been finally laid to rest by *Tahoe-Sierra* in 2002. *See Tahoe-Sierra*, 535 U.S. at 337 ("[W]e do not hold that the temporary nature of a land-use restriction precludes finding that it effects a taking; we simply recognize that it should not be given exclusive significance one way or the other."). It is apparent that the Federal Circuit's decision in the Commission's case inferred an artificial distinction from isolated dicta taken out of context in early takings decisions and incorrectly held it to be a binding, categorical rule that survived every contrary modern decision of both itself and this Court. The fact that confusion about permanency continues to persist at the level of the Federal Circuit shows how much this Court's clarity is needed.

II. Carving An Exception For Temporary Flood Invasions Conflicts With Fundamental Takings Clause Principles.

While acknowledging the rules that temporary physical invasions can take property and that floods are physical invasions, the Federal Circuit carved temporary flood invasions from the Takings Clause's protections. *See* Pet. App. 18a, 22a; Br. Opp. 13 (describing as a "requirement"); Br. Opp. 14 (describing as a "threshold"). Besides the fundamental unfairness of empowering the government to temporarily flood property and cause massive, permanent damage without compensation simply because its floods are not permanent, the decision conflicts with bedrock Takings Clause principles. Resting on misapplied, isolated dicta, the decision reflects a troubling analytical shift that protects the government's position without considering the owner's

loss. There is no fair justification and no precedent for the Federal Circuit's categorical rule.

A. The Federal Circuit's categorical permanency requirement protects the government's position without regard to the owner's loss.

The Takings Clause protects owners, not the government. *See General Motors*, 323 U.S. at 378 ("The courts have held that the deprivation of the former owner rather than the accretion of a right or interest to the sovereign constitutes the taking."); *Nat'l By-Prods.*, 405 F.2d at 1275 ("It is a long settled principle that a taking is not affected by the extent of the benefit to the Government, but solely by the amount of injury to the landowner."). The Federal Circuit's decision below shifts this principle, turning the analysis into an exercise in rationalizing the government's position. This explains how it could view decisions like *Sanguinetti* and *Fromme* as announcing a binding permanency rule while distinguishing *Cooper* in a footnote. *See* Pet. App. 18a, 26a-27a & n.7. The danger this shift presents is precisely the one this Court denounced in *Pumpelly* more than a hundred years ago: it perverts the Takings Clause "into a restriction upon the rights of the citizen . . . instead of the government . . . ." *Pumpelly*, 80 U.S. at 177-78; *see also Dickinson*, 331 U.S. at 748 ("The Constitution is 'intended to preserve practical and substantial rights, not to maintain theories.'").

Government entities have historically defended themselves by advancing all kinds of artificial distinctions, as the United States does here. But following the correct principles underlying the

Constitution, takings law has steadily moved away from such distinctions. In the first inverse condemnation case before it, this Court resoundingly rejected the first of these distinctions that title stayed with the landowner when the government permanently flooded it, saying:

> It would be a very curious and unsatisfactory result, if in construing a provision of constitutional law, always understood to have been adopted for protection and security of rights of the individual as against the government, and which has received the commendation of jurists, statesmen, and commentators as placing the just principles of the common law on that subject beyond the power of ordinary legislation to change or control them, it shall be held that if the government refrains from the absolute conversion of real property to the uses of the public it can destroy its value entirely, can inflict irreparable and permanent injury to any extent, can, in effect, subject it to total destruction without making any compensation, because, in the narrowest sense of that word, it is not *taken* for the public use. Such a construction would pervert the constitutional provision into a restriction upon the rights of the citizen, as those rights stood at the common law, instead of the government, and make it an authority for invasion of private right under the pretext of the public good, which had no warrant in the laws or practices of our ancestors.

Pumpelly, 80 U.S. at 177-78.

And for a time, some believed that the Takings Clause provided no protection against anything but a total, permanent, and exclusive physical occupation. *See Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1014 (1992) (discussing the history of takings jurisprudence). That distinction died in the twentieth century. *See, e.g., Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 416 (1922) (recognizing that the government can subject private property to public use through regulatory interferences); *Causby*, 328 U.S. at 262 (holding that the government can take property without totally destroying the owner's use and enjoyment). The Takings Clause protects every property interest an owner may have. If the government chooses to take less than the fee simple title, it still must pay.

Now the Federal Circuit has created another artificial distinction that hinges the possibility of a taking on whether the government *intends* to create a permanent flooding condition, which it speculates *might* be found after 50 consecutive years of identical deviations. *See* Pet. App. 21a-23a, 27a; *see also* Pet. App. 169a (Dyk, J., et al., concurring in denial of rehearing). This distinction, like those this Court has rejected before, ignores the owner's perspective. The Fifth Amendment's Takings Clause is designed to protect the people. Those protections cannot depend on the whim of the government as to how long it wants to use someone else's property. As Judges Moore, O'Malley, and Reyna recognized, allowing the government to subjectively dictate when its invasions might call for just compensation "elevates form over substance and leads to untenable results with enormous future consequences." Pet. App. 171a (Moore, J., et al., dissenting from denial of rehearing).

Showing again how it viewed the situation entirely from the government's perspective, the Federal Circuit never considered how much damage the United States' flooding actions caused or how much it preempted the Commission's use and enjoyment of its property. *See, e.g.*, Pet. App. 22a. Here, the Commission's loss is massive and permanent, and the Corps' flood invasions substantially preempted the use and enjoyment of the Commission's property maintained as an important wildlife habitat. Even in a regulatory takings analysis where the government has exercised otherwise valid police powers, the extent to which it interferes with investment-backed expectations (*i.e.*, the injury) is important. *See Lingle*, 544 U.S. at 540 (noting that the "inquiry turns in large part, albeit not exclusively, upon the magnitude of a regulation's economic impact and the degree to which it interferes with legitimate property interests").

The Federal Circuit also treated each deviation as a wholly isolated action despite scientific consensus among both parties' experts that the consecutive years of flooding had a cumulative impact. *Compare* Pet. App. 24a-25a; *and* Pet. App. 167a (Dyk, J., et al., concurring in denial of rehearing); *and* Br. Opp. 3, 7, 10, 11 n.3, 13; *with* J.A.110-13 (describing nuttall and overcup oak as being unable to tolerate four or five years of anerobic conditions); *and* J.A. 175 (explaining that bottomland hardwood forest "is not adapted to six consecutive years of prolonged flooding"); *and* J.A. 331-33 (agreeing that that one year of growing season flooding will not typically induce mortality but multiple years can kill trees because the effects of flooding are cumulative); *see also* Pet. App. 89a, 107a-108a, 114a (rejecting the idea that the government's

actions were "isolated invasions that might merely constitute a tort").

The panel majority, although not entirely accurately, took pains to describe the various individual deviations to show that they were different. Pet. App. 6a-13a. But as even the United States' own expert witness testified, each successive year's flooding had a bigger impact than it otherwise would have had in isolation. *See* J.A. 331-33; *cf. Portsmouth Harbor*, 260 U.S. at 329-30 ("[W]hile a single act may not be enough, a continuance of them in sufficient number and for a sufficient time may prove [a taking]. Every successive trespass adds to the force of the evidence."). That growing season floods caused by the Corps' deviations continued for six consecutive years beyond any that had occurred naturally or artificially in recorded history made this an unprecedented flooding regime. *See* Pet. App. 88a, 107a; J.A. 83-84, 174-75. When the takings question is approached from the landowner's perspective, it is apparent that these flood invasions pressed the property into public use even though the Corps eventually decided to end its invasive actions.

B. Allowing the government to freely flood temporarily when it must pay to flood permanently is manifestly unfair.

To hold that *any* form of physical invasion by the government is not subject to the Fifth Amendment based solely on its intended duration comes nowhere near to fulfilling the purposes of the Takings Clause. That Clause requires just compensation to "bar Government from forcing some people alone to bear public burdens which, in all fairness and justice,

should be borne by the public as a whole." *Armstrong*, 364 U.S. at 49; *see also Dickinson*, 331 U.S. at 748 ("The Fifth Amendment [Takings Clause] expresses a principle of fairness . . . ."); *Pennsylvania Coal Co.*, 260 U.S. at 416 ("[A] strong public desire to improve the public condition is not enough to warrant achieving the desire by a shorter cut than the constitutional way of paying for the change."). The Federal Circuit's decision imposed a categorical requirement that squarely contradicts that purpose. Here, it renders irrelevant six years of actual invasions and massive, foreseeable damage. In this case, the Court of Federal Claims recognized that the Commission was affected to the tune of at least $5.6 million for timber taken and $176,428 needed to regenerate crucial bottomland hardwood habitat used by migratory birds, other wildlife, and recreationists.

The government is already immune in tort for damages caused by flood control projects. *See* 33 U.S.C. § 702c. Now under the Federal Circuit's ruling, the Corps need only refuse to make a decision on how it will act even one year from now to avoid takings liability. *See* Pet. App. 171a (Moore, J., et al., dissenting from denial of rehearing). This rule, if allowed to stand, will potentially affect everyone and everything, including wildlife and habitat, that lies upstream or downstream of a government flood control project. Holding that the government may freely invade temporarily by any mode allows it to do what *Armstrong* said the Takings Clause was designed to prevent.

That the Corps' purposes for temporarily changing its flood control plan may not have been malicious and might have advanced some public interest is beside the

question. "[T]he applicability of express constitutional guarantees is not a matter to be determined on the basis of policy judgments made by the legislative, executive or judicial branches. Nor can the vindication of those rights depend on the expense in doing so." *San Diego Gas & Elec. Co.*, 450 U.S. at 661 (Brennan, J., dissenting). While the Corps may be allowed to temporarily manipulate flooding regimes to benefit one at the expense of another, it must pay just compensation when it does so.

The Federal Circuit's categorical permanency rule is palpably unjust and unfair. The Court of Appeals should have confronted the question of whether the government may use the Commission's property for flood storage and inflict massive and foreseeable damage over the course of consecutive years without paying just compensation. So far it has not, outside of the dissenting opinions of four of its judges who would have found a taking. Pet. App. 36a (Newman, J., dissenting) ("No error has been shown in the trial court's view of the facts and law."); Pet. App. 172a (Moore, J., et al., dissenting from denial of rehearing) ("There is no error in [the trial court's] decision.").

CONCLUSION

This Court should reverse the Federal Circuit's decision and remand to that court for further proceedings.

Respectfully Submitted,

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June 27, 2012

RESPONDENT'S BRIEF

No. 11-597

In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION, PETITIONER

v.

UNITED STATES OF AMERICA

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF FOR THE RESPONDENT

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QUESTION PRESENTED

The Court of Federal Claims found that during several years in the 1990s, temporary and irregular changes in water releases from a flood-control dam operated by the United States Army Corps of Engineers marginally increased the number of days on which part of petitioner's wetland property—which is located 115 miles downstream of the dam and has long been subject to regular natural flooding—was inundated. The question presented is as follows:

Whether the Corps' releases of water effected a Fifth Amendment taking of petitioner's property.

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In the Supreme Court of the United States

No. 11-597

ARKANSAS GAME & FISH COMMISSION, PETITIONER

v.

UNITED STATES OF AMERICA

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF FOR THE RESPONDENT

OPINIONS BELOW

The opinion of the court of appeals (Pet. App. 1a-37a) is reported at 637 F.3d 1366. The opinions on denial of rehearing en banc (Pet. App. 165a-179a) are reported at 648 F.3d 1377. The opinion of the Court of Federal Claims (Pet. App. 38a-161a) is reported at 87 Fed. Cl. 594.

JURISDICTION

The judgment of the court of appeals was entered on March 30, 2011. A petition for rehearing was denied on August 11, 2011 (Pet. App. 162a-164a). The petition for a writ of certiorari was filed on November 9, 2011, and was granted on April 2, 2012. The jurisdiction of this Court rests on 28 U.S.C. 1254(1).

STATEMENT

1. For nearly two centuries, the United States Army Corps of Engineers (Corps) has played an essential role in developing, managing, and protecting the Nation's water resources. From the beginning, the Corps has managed and improved navigable waters, and today it is responsible for 25,000 miles of commercial navigtion channels and hundreds of locks and dams. See *The U.S. Army Corps of Engineers: A History* 31-53 (2007); Corps, *Civil Works Missions: Navigation*, http://www.usace.army.mil/Missions/CivilWorks/Navigation.aspx. The Corps' water-resource management responsibilities also include flood control (or, more accurately, flood-damage risk reduction). Federal involvement in flood control dates to at least 1849, but it was after a series of deadly and devastating floods in the early 20th century that Congress enacted legislation "directly and openly aimed at flood control," the Flood Control Act of 1917, ch. 144, 39 Stat. 948. See Corps, Engineer Pamphlet (EP) 870-1-29, *The Evolution of the 1936 Flood Control Act* 3-4, 8 (1988).

The Flood Control Act of 1928, ch. 569, 45 Stat. 534—enacted in response to the catastrophic lower Mississippi River flooding of 1927, which then-Secretary of Commerce Herbert Hoover described as the "greatest disaster of peace times in our history"—authorized the "largest public works project undertaken up to that time in the United States." EP 870-1-29, at 17-18; *United States* v. *James*, 478 U.S. 597, 606-607 (1986). Soon thereafter, Congress established the first nationwide flood-control program. Flood Control Act of 1936, ch. 688, 49 Stat. 1570.

Today, the Corps has built or controls 11,750 miles of levees, and it maintains and operates more than 690 dams that store more than 100 trillion gallons of water.

Those assets serve purposes ranging from flood control—with benefits to life, property, and the environment—to navigation, water supply, hydropower, and recreation. Corps facilities store 3 trillion gallons of municipal and industrial water supplies, provide 24% of the Nation's hydropower capacity, and receive 370 million visitors per year. The Corps' flood-control projects produce great benefits: Between 2000 and 2009, those projects are estimated to have prevented an average of $22.3 billion of damage per year. And those benefits come at a comparatively low cost: On average since 1928, the Corps' projects have cost only $1 for every $7.17 in damage they have prevented. See Nat'l Research Council, *National Water Resources Challenges Facing the U.S. Army Corps of Engineers* 32-33 (2011). Approximately 4.5 million people live or work behind the Mississippi River and Tributaries project, which is the Corps' largest. It protects 22.4 million acres, has provided a 34-to-1 return on investment, and in 2011 alone prevented flooding of more than 10 million acres and damages of more than $110 billion. Miss. River Comm'n, *2011 MR&T Flood Report* 2, 4, http://www.mvd.usace. army.mil/mrc/pdf/MRC_2011_Flood_Report.pdf.

A similar but distinct set of water-management responsibilities is carried out by the Bureau of Reclamation (Reclamation) in the Department of the Interior. Reclamation was charged by Congress in 1902 with "the construction and maintenance of irrigation works for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands" in 16 western States. Act of June 17, 1902, ch. 1093, 32 Stat. 388. Today, Reclamation operates 476 dams, 337 reservoirs, and more than 8100 miles of irrigation canals, some of which serve flood-control purposes. Its facilities store nearly 80 trillion gallons of water that irrigate 10 million acres

of farmland, which in turn produce 25% of the Nation's fruit and nut crop and 60% of the Nation's vegetable crop. Reclamation facilities also provide 10 trillion gallons of water for more than 31 million municipal, residential, and industrial water users, and they support 17% of the Nation's hydropower production. See U.S. Bureau of Reclamation, *Reclamation Quickfacts*, http://www.usbr.gov/facts.html.

2. a. The Black River (River) flows south from Missouri into Arkansas. Pet. App. 3a, 46a; J.A. 685. Before it was dammed, the River regularly flooded lands along its banks, including the floodplain areas of petitioner Arkansas Game and Fish Commission's property at issue here. J.A. 437-438, 444, 598, 687; Pet. App. 59a-60a.

In the 1940s, the Corps constructed Clearwater Dam (Dam) to control flood waters from the River. Pet. App. 3a, 46a; J.A. 686; see Flood Control Act of 1938, ch. 795, 52 Stat. 1215, 1218 (authorizing and appropriating funds for the construction of the "general comprehensive plan for flood control and other purposes in the White River Basin," including the Black River). The Corps completed construction of the Dam in 1948. Pet. App. 46a. Approximately 900 square miles of the river basin are above the Dam and approximately 1000 square miles of the basin are below the Dam but upriver of petitioner's property. J.A. 239, 492, 494-497, 733. "The primary purpose of Clearwater Dam is to provide flood protection below the dam and to maintain a permanent conservation pool for recreation, fish and wildlife, and other incidental uses." J.A. 504; see Pet. App. 47a. The direct flood losses prevented by the Dam were estimated to exceed $7.75 million annually, on average, for fiscal years 1982 to 1992. A major portion of those losses would have been damage to crops. Besides this agricultural benefit, Clearwater Lake (Lake) behind the Dam has served about a million

recreational visitors per year. See J.A. 502, 504 (tallying benefits from 1982 to 1992).

b. Petitioner owns and manages the Dave Donaldson Black River Wildlife Management Area (WMA), which begins approximately 115 miles downriver from the Dam. Pet. App. 2a-3a. Typically, it takes six or more days for water released from the Dam to reach the WMA. See J.A. 239-240, 413. The WMA embraces 23,000 acres of floodplain lands straddling 32 miles of the River. Pet. App. 3a, 41a-42a; J.A. 436-438, 500, 732. Petitioner purchased much of the land that constitutes the WMA in the 1950s and 1960s, after construction of the Dam. Pet. App. 42a; J.A. 598.

The WMA regularly flooded before and after the Dam's construction. Pet. App. 14a-15a, 59a-60a; J.A. 444, 598, 687. Petitioner's experts stated that pre-dam flooding on the WMA ranged from 55 days in 1940 to 166 days in 1942, with on average about 54 days of natural high water during the timber-growing season that would lead to flooding of the WMA. J.A. 444, 449, 687; Pet. App. 59a-60a. In addition to the natural flooding, petitioner has created several "green tree reservoirs" on the WMA that it intentionally floods during the winter and spring to facilitate duck hunting. Pet. App. 44a; Pet. Br. 5.

c. The Corps releases waters from the Lake behind the Dam into the River. Pet. App. 3a-4a, 46a. In 1953, the Corps adopted the *Clearwater Lake Water Control Manual* (Manual) to guide operations of the Dam. Pet. App. 4a; J.A. 492-532 (Manual dated July 1995). Pursuant to the Manual, the Corps structured the timing and amount of water releases to reduce flooding on the River. J.A. 504-510. Among other things, the Manual provided for "normal regulation" water releases. Those releases were tied to the stage (*i.e.*, height) of the River measured at a gauge at Poplar Bluff, Missouri, approximately 32

miles downriver from the Dam. Pet. App. 4a-5a, 46a. Specifically, the Manual set water-release levels to target a stage of 10.5 feet at Poplar Bluff during the growing season and 11.5 feet during the non-growing season. J.A. 509-514. The choice of levels "allowed for the quick release of water during the growing season, so flooding occurred in short-term waves rather than over extended periods." Pet. App. 5a.

The Manual also provided for deviations from the "normal regulation" releases for emergencies, unplanned minor deviations, and planned deviations requested for agricultural, recreational, and other purposes. Pet. App. 5a; J.A. 527-530. Planned deviations were "for specific activities that required deviations only for limited periods of time, such as the harvesting of crops, canoe races, and fish spawning." Pet. App. 6a. Such deviations can optimize the flood-control benefits of the Dam by, for example, delaying water releases until a farmer has harvested crops from a field in the River's floodplain. J.A. 505-506 (Manual) ("During the agricultural season, deviations from the normal regulation plan have often been approved due to agricultural needs between Poplar Bluff and the Missouri-Arkansas state line. Regulating stages of 5 to 6 feet at Poplar Bluff are typical of those deviated to during times when crops are being planted and harvested."); J.A. 528 (similar).

The Corps approved a number of different deviations between 1993 and 2000. The various deviations were in response to different requests, were for different times of the year, and provided for different water releases to target different river stages at Poplar Bluff. Pet. App. 6a-13a. This case concerns deviations in 1993 through

1998.[1] See *id.* at 11a-13a (chart summarizing deviations). In particular:

- In 1993, downstream farmers along the River requested that the Corps slow water releases to protect crops through the harvest season. Pet. App. 6a. The Corps approved a 2½-month deviation from normal regulation releases, from September 29 to December 15. *Ibid.* That deviation set the target stage of the River at Poplar Bluff at 6 feet.
- In 1994, the Corps approved deviations from April through November, in response to a proposal from a group of public and private entities that was working to build a consensus on permanent revisions to the Manual. Pet. App. 7a-8a. Those deviations set the target stage at 11.5 feet for the first two weeks of April, then at 8 feet for the next month, and then at 6 feet from mid-May through November. *Id.* at 8a.
- In 1995, the Corps approved deviations that mirrored those in 1994. Pet. App. 8a.
- In 1996, the Corps approved new deviations, with target stages of 6 feet in June and 5 feet from July through November, in response to a proposal from a group of public and private entities related to the group that proposed the 1994 and 1995 deviations. Pet. App. 8a-9a.
- In 1997, the Corps approved a short deviation to a target stage of 6 feet from June 3 to July 5 to prevent possible downstream agricultural flooding. Pet. App. 9a.

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[1] The parties agree that, because of drought conditions, deviations in 1999 and 2000 did not cause any flooding. Pet. 3; Pet. App. 15a, 61a, 75a.

- In 1998, the Corps approved a deviation with a target stage of 5 feet from June 11 to November 30 to prevent possible downstream agricultural flooding. Pet. App. 9a, 12a.

Petitioner did not contend that these deviations were unauthorized.

The Corps also considered whether to amend the Manual to make a permanent change to the water-release patterns. The Corps and petitioner participated in working groups of interested parties weighing various options. Although the working groups proposed some of the temporary deviations described above, they did not reach a consensus on permanent changes. Pet. App. 6a-10a. In April 2001, the Corps decided against any permanent changes to the Manual's normal release patterns, after preparing an Environmental Assessment pursuant to the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.* Pet. App. 9a-10a; J.A. 685-727 (Environmental Assessment); J.A. 488-491 (Corps' announcement that it would make normal regulation water releases).

d. According to the testimony of petitioner's experts in this case, the deviations described above caused incrementally longer periods of flooding on the WMA. Petitioner's theory at trial was that the Corps' operational decisions to target lower stages at Poplar Bluff (relative to normal regulation described in the Manual) prolonged the release of water from the Lake; that those prolonged releases resulted in longer sustained high-river stages as measured by the gauge at Corning, Arkansas (approximately 105 miles downriver of the Dam and 10 miles upriver of the WMA, see J.A. 583); that the sustained high river stages at Corning caused ordinary growing-season flooding on the WMA to last longer than

usual before draining; and that the flooding ultimately weakened and damaged petitioner's trees. See Pet. App. 104a-128a.

Petitioner's experts based their theory of causation on the fact that more days with high river stages—specifically stages of 5 feet or higher at Corning, which were associated with flooding on the WMA—were noted during the deviation years than during years prior. Assuming, *arguendo*, that causation can be properly inferred from those observations alone (but see pp. 47-50, *infra*), petitioner's experts' data characterized the size of the effect of the Corps' operational decisions in the following ways:

- During the important growing-season months of June, July, and August, the Corning gauge registered 5 feet or higher an average of 14.2 days per month during the deviation years (1993-1999) versus an average of 11.4 days per month in the decade prior (1983-1992). App., *infra*, 2a; see J.A. 463.
- During the full timber-growing season (approximated as April through September), the Corning gauge registered 5 feet or higher an average of 17.3 days per month during the deviation years (1993-1999) versus an average of 14.7 days per month in the decade prior (1983-1992). App., *infra*, 3a; see J.A. 463.
- During the full timber-growing season (early April through mid-October), the Corning gauge registered 5 feet or higher an average of 15.6 days per month during the deviation years (1993-1999) versus an average of 11.0 days per month in the years after the Dam's construction (1949-1992). App., *infra*, 1a; see J.A. 449; Pet. App. 60a.

Thus, petitioner's experts' testimony was, in effect, that the WMA was already subject (depending on what data are used) to 11-15 days of flooding each month during the growing season on average, and the Corps' operational decisions added a few days per month, for a total of 14-17 days of flooding each month on average.

3. In 2005, petitioner sued the United States in the Court of Federal Claims (CFC), alleging that the deviations in 1993 through 1998 effected a taking of its property under the Fifth Amendment. Pet. App. 13a; Pet. Br. 2-3. Petitioner asserted that the chain of causation described above weakened many trees, causing some to later die or decline during a 1999-2000 drought. Pet. Br. 12, 16-17; Pet. App. 13a, 15a. In response, the United States argued that petitioner's forested floodplain lands were already subject to regular growing-season flooding; that the releases had very little effect on the duration of flooding or drainage time; that any increase in flooding did not harm petitioner's trees; and that any increased flooding did not rise to the level of a taking. Pet. App. 13a-14a, 16a, 41a, 86a-87a.

The CFC conducted a bench trial. The court held the United States liable for a taking of a temporary flowage easement over the WMA. Pet. App. 2a. The court awarded petitioner a total of approximately $5.8 million in compensation for dead timber, declining timber, and restoration costs, plus interest. *Id.* at 2a, 161a.

4. The court of appeals reversed. Pet. App. 1a-37a. As relevant here, the government argued that the deviations did not actually lead to any significant increase in flooding 115 miles downstream from the Dam, contending that the CFC erred in rejecting the government's modeling of the impact of the deviations and crediting petitioner's simplistic reliance on gauge-level data. Gov't C.A. Br. 31-37; see pp. 47-50, *infra*. The government

further argued that, in all events, the deviations did not effect a taking because they were only temporary, any increased flooding attributable to the deviations was insubstantial and incremental, the government did not directly benefit from the deviations, the flooding was not predictable, and the cumulative weighing of these factors indicated that no taking had occurred. Gov't C.A. Br. 18-41.

The Federal Circuit held that petitioner had failed to establish a taking of a flowage easement over its floodplain property. The court determined that any increased flooding was an "inherently temporary condition" resulting from "ad hoc or temporary" releases. Pet. App. 21a, 23a. The court traced the distinction between government-caused flooding that is at most a tort and government-caused flooding that is a taking. Tortious flooding results in "[a]n injury that is only 'in its nature indirect and consequential,'" *id.* at 18a (quoting *Sanguinetti* v. *United States*, 264 U.S. 146, 150 (1924)), while flooding that rises to the level of a taking consists of overflows that "constitute an actual, permanent invasion of the land, amounting to an appropriation of and not merely an injury to the property," *ibid.* (quoting *Sanguinetti*, 264 U.S. at 149 (emphasis omitted)).

The court of appeals stressed that "all of the deviations from 1993 to 2000 were approved only as temporary or interim deviations. The multiple interim plans differed. Even where deviations were the same in consecutive years, such as in 1994 and 1995, the Corps had to approve an extension of the interim deviation plan for the second year." *Id.* at 24a. The court concluded that, because the deviations here "were plainly temporary * * * [and] cannot be characterized as inevitably recurring," they cannot constitute a taking and "at most created tort liability." *Id.* at 27a-28a.

Judge Newman dissented. She would have held that the flooding constituted a taking because it was not of a "short duration" and it caused significant damage. Pet. App. 29a-37a.

5. The court of appeals denied petitioner's petition for rehearing en banc. Pet. App. 162a-164a. Concurring in the denial of rehearing, Judge Dyk, the author of the panel opinion, explained that the Corps "made a series of ad hoc and independent decisions to deviate from the normal release rates at a dam in Missouri, which sometimes caused intermittent flooding on the plaintiff's property." *Id.* at 167a-168a. "Each interim plan differed from the next, as the Corps and interested parties tried different ideas and attempted to come to an agreement." *Id.* at 168a. Judge Moore and Judge Newman filed opinions dissenting from the denial of rehearing en banc. *Id.* at 170a-179a.

SUMMARY OF ARGUMENT

This case concerns whether the Corps' temporary and discrete determinations about operating Clearwater Dam took petitioner's floodplain lands by subjecting them to longer-than-normal periods of flooding. There was no taking.

A. Any incremental flooding of petitioner's lands caused by each of the Corps' separate operational decisions was not a taking because it was temporary. This Court has "consistently distinguished between flooding cases involving a permanent physical occupation, on the one hand, and cases involving a more temporary invasion, or government action outside the owner's property that causes consequential damages within, on the other. A taking has always been found only in the former situation." *Loretto* v. *Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 428 (1982).

That distinction was firmly established nearly a century ago, and it permits a determination that there was no taking to be made without considering other factors that might, under other circumstances, bear on whether the government has taken private property. This Court and lower courts have consistently adhered to that distinction; Congress has enacted extensive flood-control legislation against the backdrop of that distinction; and the Executive's land-acquisition practices and operational decision-making likewise have been undertaken in conformity with that distinction.

Moreover, the distinction between temporary and permanent flooding is sound and practical. Because floodwaters recede, flooding that is not permanent does not burden land in the way this Court has demanded to find a physical taking. The rule that temporary flooding is not a taking makes particular sense in the context in which this Court has recognized the rule, *viz.*, where the claimant's land is already subject to flooding, and the government causes only incremental flooding.

Petitioner argues that this Court's flooding cases are inconsistent with the concept of a "temporary taking." Petitioner is mistaken for two basic reasons. First, the decisions on which petitioner relies do not address flooding and therefore do not eclipse this Court's flooding-specific precedents. Second, petitioner's argument relies entirely on cases that either recognize a taking when the government exclusively occupies private property for a finite period of time, or hold that such a taking requires just compensation. Those cases shed no light on the question here, which is whether a temporary invasion of riparian land by floodwaters brings about a taking in the first place.

In this case, any incremental flooding resulting from each of the Corps' separate operational determinations was temporary. As the court of appeals explained:

> [A]ll of the deviations from 1993 to 2000 were approved only as temporary or interim deviations. The multiple interim plans differed. Even where deviations were the same in consecutive years, such as in 1994 and 1995, the Corps had to approve an extension of the interim deviation plan for the second year.

Pet. App. 24a.

B. Even without giving controlling effect to the temporary nature of the flooding here, petitioner's claim fails.

Petitioner's amici argue that the standards articulated in this Court's flooding cases should be jettisoned in favor of a per se rule that any flooding resulting from the operation of a government project is a taking. That approach cannot be squared with *Loretto*; it rests on inapt analogies to cases involving direct physical occupation by the government; and it would be too blunt an instrument to evaluate an issue as complex as downstream flooding resulting from the operation of a dam.

Rather, as petitioner recognizes, if the temporary nature of the flooding does not preclude finding a taking, then a takings claim based on flooding of private lands downriver of a government project would be subject to an ad hoc factual analysis. Full consideration of a range of factors shows that petitioner has failed to establish a taking of a flowage easement over its floodplain lands. Four considerations weigh strongly against recognizing a taking here. First, as a riparian owner of floodplain lands, petitioner could have only limited expectations about the timing and volume of water flows on the River. Second, flood control, like other government responses

to forces of nature, permissibly adjusts the benefits and burdens of water to serve the public good. Third, the WMA is already subject to extensive flooding. The CFC's finding that the Corps' operational choices caused incremental flooding on the WMA was fundamentally flawed to begin with. But even accepting that finding, the most that petitioner's experts' testimony established is that the WMA was ordinarily flooded a dozen or so days each month, and adjustments to the Dam's operation increased that flooding by a few days per month. Fourth, even if operational decisions at the Dam in 1993 had an effect the following decade on trees over 100 miles downriver, that effect can only be described as indirect and consequential, and therefore is not compensable as a taking.

ARGUMENT

THE UNITED STATES DID NOT TAKE PETITIONER'S PROPERTY

The Fifth Amendment provides that "private property [shall not] be taken for public use, without just compensation." The question presented is whether the Corps' temporary and discrete determinations about operating Clearwater Dam in 1993 through 1998 took petitioner's floodplain lands by subjecting them to longer-than-normal periods of intermittent flooding. Applying the foundational precedents from this Court on which the Nation's systems of flood control and irrigation rely, the court of appeals correctly held that the operational effects of the Corps' determinations were too temporary and ad hoc to effect a taking. But even if the Court were to depart from those longstanding precedents, an analysis of other relevant factors as well shows that the Corps' flood-control activity did not rise to the level of a taking of petitioner's property. Under either

approach, the judgment of the Federal Circuit denying compensation should be affirmed.

A. Any Incremental Flooding Of Petitioner's Floodplain Lands Caused By The Corps' Operational Decisions Was Not A Taking Because It Was Temporary

The trial in this case established that "all of the deviations from 1993 to 2000"—and hence the flooding that the CFC found them to cause—"were approved only as temporary" measures, and "[t]he multiple interim plans differed." Pet. App. 24a. Those critical facts control this case under this Court's long-established rule that temporary invasions of riparian land by floodwaters do not constitute a taking.

1. This Court has consistently held that temporary flooding of riparian lands is not a taking

By drawing and applying a distinction between temporary and permanent flooding, this Court has made clear that temporary flooding of riparian land is not a taking. That distinction is sound; the government has long relied on it in deciding whether to build and how to operate flood-control projects across the Nation; and it has long been a background rule governing the property interests of riparian landowners.

a. The court of appeals applied a test developed and settled by this Court nearly a century ago

In its leading modern decision concerning takings of private property by physical occupation, this Court emphasized that it has "consistently distinguished between flooding cases involving a permanent physical occupation, on the one hand, and cases involving a more temporary invasion, or government action outside the owner's property that causes consequential damages within, on the other. A taking has always been found only in the

former situation." *Loretto* v. *Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 428 (1982) (citing *United States* v. *Lynah*, 188 U.S. 445, 468-470 (1903); *Bedford* v. *United States*, 192 U.S. 217, 225 (1904); *United States* v. *Cress*, 243 U.S. 316, 327-328 (1917); *Sanguinetti* v. *United States*, 264 U.S. 146, 149 (1924); *United States* v. *Kansas City Life Ins. Co.*, 339 U.S. 799, 809-810 (1950)). That sensible distinction controls this case.

i. The distinction between temporary and permanent flooding was firmly established nearly a century ago, in the era of the first major federal flood-control legislation, the Flood Control Act of 1917. In its 1924 decision in *Sanguinetti*, this Court held that to constitute a taking, government-caused flooding of land already subject to flooding must (among other criteria) "constitute an actual, permanent invasion of the [private] land." 264 U.S. at 149. The claimant's land in *Sanguinetti* sat between a river and a slough. The land was periodically subject to flooding from the river and from heavy rainfall. *Id.* at 146. To improve the river's navigability, the Corps constructed a canal to divert water from the slough into the river, dammed the slough to divert water into the canal, and built a levee along the lower side of the canal. After the canal was completed, there was one flood of "unprecedented severity" and, in some of the following years, "recurrent floods of less magnitude." *Id.* at 147. Much as petitioner claims here, the floods in *Sanguinetti* "damag[ed] and destroy[ed] crops and trees and injur[ed] to some extent the land itself." *Ibid.*

The landowner sued the United States, contending that the temporarily flooded property had been taken. This Court noted several factual weaknesses in the landowner's case, including that the land would have flooded in the absence of the canal, that the difference in the extent of flooding was unknown, that the flooding did not

ultimately prevent the land's use for agriculture, and that the government did not anticipate that the canal would prove insufficient during heavy rainfall. *Sanguinetti*, 264 U.S. at 147-148. But in deciding the case, the Court unmistakably interpreted the Just Compensation Clause to rule out temporary flooding as a taking: "to create an enforceable liability against the Government, it is, at least, necessary that the overflow [on private land] be the direct result of the [government-built and managed] structure, and constitute an actual, permanent invasion of the land, amounting to an appropriation of and not merely an injury to the property." *Id.* at 149.

The Court recognized "that there was probably some increased flooding due to the canal and that a greater injury may have resulted than otherwise would have been the case." *Sanguinetti*, 264 U.S. at 150. But the landowner's takings claim nonetheless failed because the Court held that the permanent-invasion requirement was not met. There was no ouster of possession, and any limitation on the landowner's "customary use of the land" was for "short periods of time." *Id.* at 149. Nor was there evidence of "permanent impairment of value" of the land itself, *ibid.*, as distinguished from the concededly "damag[ed] and destroy[ed] crops and trees," *id.* at 147. The injury was "indirect and consequential," at most a tort, not a taking. *Id.* at 150.

Earlier decisions addressing claims of flooding-based takings had already established the principles that coalesced in *Sanguinetti*'s holding. In *Pumpelly* v. *Green Bay & Mississippi Canal Co.*, 80 U.S. (13 Wall.) 166 (1872), this Court addressed a claim (under a provision of the Wisconsin Constitution "almost identical in language" to the Just Compensation Clause, *id.* at 177) for what is now recognized as the archetypal taking by flood-

waters: the inundation of land by backwaters behind a dam. The "superinduced" backwaters in *Pumpelly* were a permanent result of the completed dam, which raised the level of an existing lake behind the dam and caused "irreparable and permanent injury" to the claimant's land. *Id.* at 177, 181. The Court again stressed permanence as the hallmark of a taking by floodwaters in *Lynah*, holding that, where a dam caused the claimant's property to be "permanently flooded, wholly destroyed in value, and turned into an irreclaimable bog," there was a taking. 188 U.S. at 469 (citing *Pumpelly*).[2]

Then, in *Cress*, this Court addressed the situation of riparian lands on a tributary "subject to frequent"—but not continuous—"overflows of water from the [tributary]," caused by a downstream lock and dam erected on the main river. 243 U.S. at 318. The Court's precedents at that time left open the possibility that such flooding would not be a taking (because it was temporary, even if recurring). And the Court had not had occasion to distinguish between temporary and permanent flooding, so it would have been possible for the Court to hold for the claimant even if it had regarded the intermittent invasions as temporary. Indeed, the United States' primary argument in *Cress* was that a distinction should be recognized between temporary and permanent flooding, and that the land in question had not been permanently flooded in a way recognized as a taking. See U.S. Br. at 6-10, *Cress*, *supra* (O.T. 1916, No. 84).

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[2] Many of this Court's other flood-related cases likewise have stressed the controlling significance of a permanent occupation of the land. See, *e.g.*, *Kansas City Life*, 339 U.S. at 810; *United States* v. *Dickinson*, 331 U.S. 745, 746-747 (1947); *United States* v. *Sponenbarger*, 308 U.S. 256, 266-267 (1939); *United States* v. *Welch*, 217 U.S. 333, 338-339 (1910).

It was thus a significant step—and not some "fortuit[y]," Nat'l Fed'n of Indep. Bus. Amicus Br. 9 n.6 (citation omitted)—that this Court resolved *Cress* by drawing the now-recognized distinction between temporary and permanent flooding, and giving content to that distinction by classifying "inevitably recurring" flooding as permanent. As *Cress* explained, the dispositive consideration was that it was "not a case of temporary flooding or of consequential injury, but a permanent condition, resulting from the erection of the lock and dam," 243 U.S. at 327, and there is "no difference of kind * * * between a permanent condition of continual overflow by back-water and a permanent liability to intermittent but inevitably recurring overflows," *id.* at 328.

ii. The judgment that temporary flooding of riparian land is not a taking can properly be made without considering other factors that might, under other circumstances, bear on whether the government has taken private property. That is particularly clear from *Cress*'s articulation of permanence as a freestanding requirement and *Sanguinetti*'s reliance on the distinction between temporary and permanent flooding as a sufficient basis for rejecting the landowner's takings claim. Petitioner argues (*e.g.*, Br. 31) that the court of appeals should have weighed what petitioner regards as other relevant factors as well, but none of this Court's many flooding cases has called for balancing, in every case, the degree of permanence of the government action against all other possible considerations.

Indeed, in applying the Just Compensation Clause in other contexts, this Court has sometimes found it appropriate to resolve, on the basis of a single factor, cases that might have instead been resolved by balancing several considerations. See, *e.g.*, *Ruckelshaus* v. *Monsanto Co.*, 467 U.S. 986, 1005 (1984) (rejecting takings claim

subject to the regulatory-takings framework of *Penn Central Transp. Co.* v. *New York City*, 438 U.S. 104 (1978), on the single factor that the claimant lacked a reasonable, investment-backed expectation); *Block* v. *Hirsh*, 256 U.S. 135, 157 (1921) (Holmes, J.) ("The [temporary tenant holdover] regulation is put and justified only as a temporary measure. A limit in time, to tide over a passing trouble, well may justify a law that could not be upheld as a permanent change.") (citations omitted).

Petitioner expresses concern (Br. 47) that if the temporariness of flooding is a sufficient basis for denying a takings claim, then the government may be able "to avoid takings liability" by "refus[ing] to make a decision on how it will act even one year from now." That concern is exaggerated, in both a legal and a practical sense. From a legal standpoint, a sufficiently prolonged series of nominally temporary but substantively identical deviations "might properly be viewed as permanent or 'inevitably recurring,'" and thus support a takings claim. Pet. App. 169a (Dyk, J., concurring in the denial of rehearing en banc) (quoting *Cress*, 243 U.S. at 328). That principle would be an appropriate check against the sort of scheme petitioner hypothesizes. But that principle does not operate here, because the record showed, and petitioner did not challenge, that "there was genuine uncertainty about the nature of the policies from year to year as the Corps responded to individualized concerns and individualized circumstances." *Ibid.*

From a practical standpoint, the procedural requirements of various environmental laws tend to cause the Corps (and other governmental actors) to make long-term decisions about how water will be managed; any ensuing flooding that could be regarded as "permanent" would potentially be compensable. For example, NEPA

requires the Corps to prepare an environmental impact statement for every major action that will significantly affect the quality of the environment, see 42 U.S.C. 4332(2)(C). Similarly, the Endangered Species Act of 1973 (ESA), 16 U.S.C. 1531 *et seq.*, may require preparation of a biological assessment by the Corps and a biological opinion by the Fish and Wildlife Service, see 16 U.S.C. 1536(a)-(d). See generally *In re Operation of the Mo. River Sys. Litig.*, 421 F.3d 618 (8th Cir. 2005) (discussing ESA and NEPA requirements related to Corps operation of flood-control and irrigation project on the Missouri River), cert. denied, 547 U.S. 1097 (2006). Those procedures necessarily require the Corps to articulate with some particularity how it proposes to operate a project so that the Corps and other agencies can evaluate the effects of a proposed course of action. That process in turn lends a relative permanence to most significant decisions affecting water-project management. See pp. 34-35, *infra* (discussing the Corps' decision, in the course of complying with NEPA, not to make permanent changes to Clearwater Dam's operation).

b. This Court's flooding cases are foundational and have generated substantial reliance interests

This Court and lower courts have consistently adhered to the foundational flooding cases discussed above; Congress has proceeded in conformity with those cases in enacting flood-control legislation; and the Executive's land-acquisition practices and operational decision-making in this field have been undertaken against the background of those cases.

i. Every flood-related case in which the Court has recognized a taking has involved a "permanent" condition, in which the land was continuously inundated or permanently liable to intermittent but inevitably recur-

ring overflows. The Court has never suggested, much less held, that anything less could effect a taking by floodwaters. And any doubt that the flooding cases retain their vitality in the modern era is put to rest by *Loretto*, which quotes *Sanguinetti* as controlling in the flooding context: "[T]o be a taking, flooding must 'constitute an actual, permanent invasion of the land, amounting to an appropriation of, and not merely an injury to, the property.'" 458 U.S. at 428 (quoting 264 U.S. at 149); cf. *Stop the Beach Renourishment, Inc.* v. *Florida Dep't of Envtl. Prot.*, 130 S. Ct. 2592, 2601 (2010) (plurality) ("[I]t is a taking when a state regulation forces a property owner to submit to a permanent physical occupation.") (citing *Loretto*, 458 U.S. at 425-426).

The Federal Circuit (and before it, the United States Court of Claims) has consistently applied this standard in deciding takings cases brought against the United States under the Tucker Act, 28 U.S.C. 1491, requiring permanence as a necessary condition to find the taking of a flowage easement. See Pet. App. 18a-22a; *Barnes* v. *United States*, 538 F.2d 865, 870 (Ct. Cl. 1976); *Fromme* v. *United States*, 412 F.2d 1192, 1197 (Ct. Cl. 1969); *National By-Products, Inc.* v. *United States*, 405 F.2d 1256, 1273-1274 (Ct. Cl. 1969); see also *Goodman* v. *United States*, 113 F.2d 914, 918-919 (8th Cir. 1940); cf. *Ridge Line, Inc.* v. *United States*, 346 F.3d 1346, 1357-1358 (Fed. Cir. 2003) (addressing claim of surface-water runoff); *Eyherabide* v. *United States*, 345 F.2d 565, 569 (Ct. Cl. 1965) (recurring invasion of claimant's land by military ordnance held a taking by reference to flooding cases).

A leading treatise on eminent domain summarizes the black-letter rule of those cases as follows:

> When a claimant's land is permanently flooded (which includes inevitable recurring overflows or continuous

> overflow) as a result of a public project, the condemnee is entitled to damages. However, if the project has resulted in a temporary injury or invasion of the land which is but the consequential result of or merely incidental to the improvement, [there is no] taking.

4A Julius L. Sackman, *Nichols on Eminent Domain* § 14A.07[4] at 14A-119 to -120 (MB 3d ed. 2008) (footnote omitted). The judicial decisions above not only have precedential force in litigation, but have also governed riparian owners' expectations and the scope of their property interests vis-a-vis flood-control projects.

ii. In 1928, when Congress embarked on "the largest public works project undertaken up to that time in the United States"—the comprehensive flood-control plan for the Mississippi River Valley—it displayed "a consistent concern for limiting the Federal Government's financial liability to expenditures directly necessary for the construction and operation of [flood-control] projects." *United States* v. *James*, 478 U.S. 597, 606-607 (1986). Congress accordingly provided that "[n]o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place." Flood Control Act of 1928, ch. 569, § 3, 45 Stat. 536 (33 U.S.C. 702c). And it correspondingly provided the Corps with authority to acquire property interests in particular circumstances in constructing flood-control projects. *Id.* §§ 3-4 (33 U.S.C. 702c-702d).

Those provisions reflect that Congress was authorizing flood-control projects with an understanding that conformed to this Court's cases holding, *inter alia*, that incidental consequences of flood-control project operation—such as temporary flooding of riparian land—would not lead to government liability. Congress understood in particular that "[d]amages to land by flooding"

that are "consequential * * * do not constitute a taking of the land flooded." 69 Cong. Rec. 7106 (1928) (remarks of Rep. Cox) (quoting headnote to *Bedford*, 192 U.S. at 217); see *id.* at 7126 (reprinting letter from President Coolidge cautioning that "it would be very unwise for the United States in generously helping a section of the country to render itself liable for consequential damages").

Congress justifiably understood in 1928 and the years that followed that, under this Court's precedents, authorizing flood-control projects would "not * * * open up a situation that will cause thousands of lawsuits for damages against the Federal Government in the next 10, 20, or 50 years." *James*, 478 U.S. at 607 (quoting 69 Cong. Rec. 6641 (1928) (remarks of Rep. Snell)). Yet petitioner argues for a rule that would do just that. The obvious result would be that the long-term cost and benefits calculus upon which Congress originally authorized flood-control projects would be upset by a new and unaccounted-for potential liability to pay just compensation when waters flowing through such projects temporarily flood downstream property.

iii. The Corps' practices in developing water resources in general, and in constructing flood-control projects in particular, are also consistent with this Court's precedents. The modern expression of the Corps' policy is the Joint Policy for Land Acquisition that the Departments of the Army and the Interior first issued in 1953. 19 Fed. Reg. 381 (1954); see 27 Fed. Reg. 1734 (1962); 31 Fed. Reg. 9108 (1966); 44 Fed. Reg. 3168 (1979).[3] It is now codified at 43 C.F.R. Pt. 8, and the Corps' applica-

[3] "Prior to 1953, the amount and character of land needed for a project was largely determined on a project-by-project basis. Usually, fee title to the land up to the project design flood line was acquired." *U.S. Army Corps of Engineers Recreation Study* 5 (1990).

tion of the policy is elaborated at 32 C.F.R. 644.4(b). The policy requires acquisition in fee of backwater land that lies below the level that will be permanently inundated (plus an appropriate margin above that level)—the prototypical taking by floodwaters. 43 C.F.R. 8.1(b). Easements are appropriate in more remote upstream areas where backwaters may form in connection with operations that raise the reservoir level—a form of inevitably recurring flooding under this Court's cases. 43 C.F.R. 8.3(b); 32 C.F.R. 644.4(b)(2)(iii) and (v).

The interest to be acquired in downstream lands is limited to an easement "required only for operational purposes." 32 C.F.R. 644.4(b)(2)(iv). This Office has been informed by the Corps that, although the voluminous and dispersed nature of the Corps' real estate records makes compiling an exhaustive catalog impracticable, those downstream acquisitions are in practice most often made when (1) project operations are expected to cause frequent and recurring flooding in the project's vicinity, or (2) there is concern that a downstream landowner might use property in a way that could effectively interfere with project operations (for example, jeopardizing the safe operation of a project by building a structure for human habitation in a risky area). The Corps has identified to this Office some examples of acquisitions of land substantially downstream of a flood-control project. But where no taking of such land is evident, the Corps does not acquire a property interest. See, *e.g.*, *George Family Trust* v. *United States*, 97 Fed. Cl. 625 (2011). And of greatest relevance here, the Corps has informed this Office that it has had no general policy or practice of

acquiring temporary easements over lands far downstream of its projects.[4]

Thus, for example, in connection with the flood-control project at issue here, the Corps acquired in fee some 18,606 acres of backwater lands lying at or below the elevation of the Dam's spillway, and has also secured easements for certain upstream areas at slightly higher elevations that the Dam has rendered permanently liable to intermittent but inevitably recurring flooding. See J.A. 493. But consistent with this Court's cases, the Corps has not acquired any interest in downstream lands on the River, let alone a temporary interest. See *ibid.* (reflecting no downriver real estate acquisition in connection with the project here).

Because those acquisition practices—as well as estimates of project costs and benefits, budget requests, and congressional appropriations—are premised in part on the distinction recognized by this Court between temporary and permanent flooding, any retreat from that distinction could be highly disruptive. Relatedly, the responsible and beneficial day-to-day or year-to-year man-

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[4] Amicus Wolfsen Land & Cattle Co. cites several cases involving condemnation of flowage easements, asserting that those cases illustrate that the government "routinely condemns and pays for flowage easements" like the one petitioner claims was taken here. Wolfsen Amicus Br. 18-19. But those cases merely illustrate the government's practice of condemning a fee interest or a permanent easement in permanently flooded lands. One case does use the phrase "permanent and temporary flowage easements," but without explanation; whatever the nature of that interest, it sheds no light on this case because the land in question there lay in counties *upriver* from the proposed dam. See *United States* v. *79.39 Acres of Land in Breckinridge & Meade Counties, Ky.*, 440 F.2d 1190, 1190 (6th Cir. 1971) (per curiam). None of the cited cases remotely suggests that temporary, incremental flooding downriver of a flood-control dam requires the government to secure a flowage easement.

agement of a flood-control project will often call for temporary and ad hoc operational decisions that necessarily have the effect of temporarily increasing or decreasing water flows at particular times and places downstream. See J.A. 527-530. Those decisions are often made in real time in response to changing conditions with the opportunity to realize significant benefits for affected landowners. The full value of a flood-control program cannot be realized if such decisions must always be made in the shadow of potential takings liability to numerous downstream landowners. Cf. *Tahoe-Sierra Pres. Council, Inc.* v. *Tahoe Reg'l Planning Agency*, 535 U.S. 302, 324 (2002) (warning against an interpretation of the Just Compensation Clause that "would transform government regulation into a luxury few governments could afford").

Petitioner makes a seemingly more modest proposal that, at least once the government has adopted a plan for releasing water, it cannot adjust that plan in a way that reduces overall flooding damage without compensating landowners who experience temporary additional flooding. See Pet. Br. 48. But for similar reasons, that sort of blind adherence to normal operating plans in the face of changing conditions would equally hamstring the operations of the Nation's flood-control system and cast in doubt the future of the government's long-running, widespread, highly successful, and socially beneficial programs of flood control (and other forms of water management).

c. This Court's distinction between temporary and permanent flooding is sound and practical

The most salient characteristic of temporary flooding is that it is temporary. Because floodwaters recede, flooding that is not permanent does not burden land in the way this Court has held to be a necessary condition

to finding a physical taking. To be sure, temporary flooding can have short-term consequences for the use of land, such as harming a season's worth of crops (see *Sanguinetti*, 264 U.S. at 147), requiring some restoration work (*Sanguinetti* v. *United States*, 55 Ct. Cl. 107, 142 (1920) (*Sanguinetti I*)), or influencing the character of natural vegetation growing on the land (as petitioner contended here). But that sort of consequential damage has always been understood to be in the nature of a tort, not a taking. See *Sanguinetti*, 264 U.S. at 149-150; *Portsmouth Harbor Land & Hotel Co.* v. *United States*, 260 U.S. 327, 330 (1922) (*Portsmouth Harbor III*). Neither petitioner nor its amici offer any satisfactory explanation why, on their understandings of the Just Compensation Clause, every passing flood attributable to the government's operation of a flood-control project, no matter how brief, could not be characterized as the taking of a flowage easement requiring payment of just compensation.

The distinction between temporary and permanent flooding is particularly sensible where, as in *Sanguinetti* and here, the claimant's land is already subject to flooding. "[I]t is the character of the invasion, not the amount of damage resulting from it, * * * that determines the question whether it is a taking." *Cress*, 243 U.S. at 328. The "character of the invasion" in this context is the same whether the floodwaters arrive by natural forces or by human intervention: the land floods, and the flood abates. At most, two floods will differ in the "amount of damage resulting from [each]," but that does not control whether a taking has occurred. *Ibid.* It is only when the challenged flooding is permanent—*i.e.*, a continuous or inevitably recurring inundation—that it assumes a "character" materially different from the pre-existing burden on the land, and could call for compensation as a taking.

Moreover, in the specific context of a flood-control dam, this Court's distinction between temporary and permanent flooding produces equitable results by assuring compensation to the relatively small class of landowners who bear distinct and significant burdens for the public good, but not for the large class of landowners who experience a mere "adjust[ment of] the benefits and burdens of [riparian] life." *Penn Central*, 438 U.S. at 124; see *Armstrong* v. *United States*, 364 U.S. 40, 49 (1960). In particular, the relatively small number of upstream landowners who suffer permanent backwater flooding are compensated, while riparian landowners ranging a hundred miles or more downstream of the dam generally must accept the benefits, and sometimes the temporary burdens, of the dam's operation.

d. Petitioner's arguments for abandoning this Court's approach to temporary flooding are unpersuasive

Petitioner argues (Br. 32-41) that this Court's flooding cases are inconsistent with the concept of a "temporary taking." That is incorrect. The Court's recognition that some invasions by floodwaters are too temporary in character to rise to the level of a taking is fully consistent with its recognition that property may be taken in the constitutional sense for a finite period of time.

In the most basic terms, the temporary-takings decisions on which petitioner relies (Br. 32-35) do not eclipse precedents like *Sanguinetti* and *Cress* addressing issues peculiar to flooding, because none of the decisions petitioner cites addressed flooding, and they are, in any event, distinguishable. For example, in *United States* v. *Causby*, 328 U.S. 256 (1946), the Court concluded that low-altitude government flights over a chicken farm imposed a servitude and remanded the case to determine if the easement was temporary or permanent. *Id.* at 268.

Causby involved the direct occupation by government instrumentalities of the airspace over the claimant's lands, rather than the indirect effects of waters that passed through a dam more than a hundred miles upriver. That indirectness, typical of flooding cases and especially evident here, distinguishes *Causby* and makes the distinction between temporary and permanent action salient here in a way it was not in *Causby*. See, *e.g.*, *Loretto*, 458 U.S. at 428, 430-431 (distinguishing temporary or indirect consequential effects of flooding from the physical occupation in *Causby*); *Batten* v. *United States*, 306 F.2d 580 (10th Cir. 1962) (refusing to extend *Causby* to find a taking by noise, vibration, and smoke from government airplanes that did not invade airspace above claimants' property), cert. denied, 371 U.S. 955 (1963). The *Causby* claimant's land instead resembles the land submerged below the backwaters behind a dam; in both cases, the government project itself is atop the claimant's land and thus amounts to governmental appropriation of that land.

Moreover, although *Causby* stands for the proposition that the government can in some circumstances take an easement for a finite period of time, it does not address the duration or degree of permanence necessary for recognizing that some easement has been taken to begin with. In *Causby*, there was no occasion to consider the minimum threshold number of temporary and ad hoc authorizations of flights over the claimant's farm that would have been necessary to effect a taking, because all agreed there were "frequent and regular flights of army and navy aircraft over respondents' land." 328 U.S. at 258.

The rest of petitioner's argument for abandoning this Court's flooding precedents suffers from the same flaw. It is irrelevant here "that once an invasion brings about

a taking of property, 'no subsequent action by the government can relieve it of the duty to provide compensation for the period during which the taking was effective.'" Pet. Br. 33 (quoting *First English Evangelical Lutheran Church* v. *County of L.A.*, 482 U.S. 304, 321 (1987)). The question in this case is whether a temporary invasion of riparian land by floodwaters "brings about a taking of property" in the first place. Petitioner's reliance on *First English* is thus misplaced because the Court there *assumed* that a taking had occurred; it did not address what a claimant must demonstrate to establish a temporary regulatory taking, let alone endorse the notion of a temporary taking by floodwaters. See 482 U.S. at 312-313.

For the same reason, petitioner is not aided by the World War II-era cases it cites in which the government physically occupied or took control of a claimant's property for a period of time. See *United States* v. *Pewee Coal Co.*, 341 U.S. 114 (1951); *Kimball Laundry Co.* v. *United States*, 338 U.S. 1 (1949); *United States* v. *Petty Motor Co.*, 327 U.S. 372 (1946); *United States* v. *General Motors Corp.*, 323 U.S. 373 (1945). As *First English* points out, 482 U.S. at 318, the sort of direct and continuous physical seizure of private property at issue in those cases is so clearly a taking that those cases addressed the measure of just compensation; they did not speak to flooding in particular or, indeed, to whether any particular governmental action is a taking in the first place. Moreover, *Loretto* discussed both *Sanguinetti* (458 U.S. at 428) and *Pewee Coal* (*id.* at 431) and found that they fit comfortably together (*id.* at 432).

2. Any incremental flooding resulting from each of the Corps' separate operational determinations was temporary

This Court's "consistent[] distin[ction] between flooding cases involving a permanent physical occupation, on the one hand, and cases involving a more temporary invasion," *Loretto*, 458 U.S. at 428, controls here.

a. The record here established, without contradiction, that the Corps' deviations from normal operations were each conceived and implemented as temporary, and varied in their timing and justifications:

> [A]ll of the deviations from 1993 to 2000 were approved only as temporary or interim deviations. The multiple interim plans differed. Even where deviations were the same in consecutive years, such as in 1994 and 1995, the Corps had to approve an extension of the interim deviation plan for the second year.

Pet. App. 24a. In turn, the court of appeals correctly concluded that because the deviations were "inherently temporary," any flooding they caused could not be "inevitably recurring" in the way this Court's precedents demand. *Id.* at 25a.

i. Many of the material facts here mirror facts in *Sanguinetti* that led this Court to conclude the flooding there was not a taking:

- Both the land here (see p. 5, *supra*) and the land in *Sanguinetti* (264 U.S. at 146, 149) were already long subject to periodic flooding.
- Both on the record here (see pp. 9-10, *supra*) and on the record in *Sanguinetti*, "[t]he most that can be said is that there was probably some increased flooding due to the [government's actions] and that a greater injury may have resulted than oth-

erwise would have been the case," though "the injury was in its nature indirect and consequential." 264 U.S. at 150.

- Both here (see pp. 5-10, *supra*) and in *Sanguinetti* (264 U.S. at 147), there were floods of varying magnitude for several years.[5]
- Neither here nor in *Sanguinetti* was the land permanently flooded. See 264 U.S. at 147.

Two other features uniquely present here underscore the limited and discrete nature of the Corps' actions, and hence the temporary nature of any flooding on the WMA. First, the deviations were in response to different requests, they lasted (at most) for a few months, they occurred at different times of the year, and they provided for different water releases (as measured by river stages at Poplar Bluff, more than 80 miles upriver of the WMA). Pet. App. 6a-13a.

Second, the Corps' deviations were avowedly not permanent. In compliance with NEPA, the Corps prepared an Environmental Assessment (J.A. 685-727) to evaluate a proposed permanent change to the Manual; but the Corps *rejected* permanent changes. Pet. App. 9a-10a; J.A. 488-491. Petitioner describes that process as "the Corps mov[ing] forward to make permanent the water release changes in the Clearwater Lake Control Man-

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[5] The claims in *Sanguinetti* sought compensation based on a single year's flooding, but the claimant's petition emphasized that the lands had suffered similar (if less severe) flooding in later years. See Tr. of R. at 2-3, *Sanguinetti*, *supra* (O.T. 1923, No. 130); see also *Sanguinetti I*, 55 Ct. Cl. at 115-116, 127 (reporter's statement). The government acknowledged the later flooding, but it pointed out that there was no evidence that later flooding reflected substantial and inevitably recurring flooding. See U.S. Br. at 6-7, *Sanguinetti*, *supra* (O.T. 1923, No. 130).

ual." Br. 31. But the fact that the Corps *considered* permanent changes, yet *rejected* them and never implemented any permanent change to water releases, in fact proves the temporary nature of what had come before.

ii. Outside the flooding context, this Court has also occasionally drawn a distinction in takings law between temporary and permanent governmental action. In particular, the Court's three decisions culminating in *Portsmouth Harbor III*, *supra*, further support the conclusion that the flooding here was not a taking. Those cases arose from the erection of a government fort inland of a seaside resort; guns were from time to time noisily fired from the fort out to sea, over the claimant's property, assertedly imposing a servitude on the claimant's property. The Court accepted from the start that there would be a taking "if the Government had installed its battery * * * with the purpose and effect of subordinating the strip of land between the battery and the sea to the right and privilege of the Government to fire projectiles directly across it * * * whenever it saw fit." *Portsmouth Harbor III*, 260 U.S. at 329 (quoting *Peabody* v. *United States*, 231 U.S. 530, 538 (1913)).

Applying that standard in the first case (*Peabody*), this Court found no taking because guns had been fired on only two occasions, and there was no proof that further shots would be fired. *Portsmouth Harbor III*, 260 U.S. at 328. "The second case was like the first except for 'some occasional subsequent acts of gun fire.'" *Ibid.* (quoting *Portsmouth Harbor Land & Hotel Co.* v. *United States*, 250 U.S. 1, 2 (1919)). The trial court denied relief in the third case on the pleadings, but this Court reversed because it found that the allegations about past firing and recent emplacement of guns at the fort with a view to firing them over the claimant's land were sufficient to "warrant a finding that a servitude has

been imposed." *Id.* at 329-330. As Justice Holmes explained for the Court, "while a single act may not be enough, a continuance of them in sufficient number and for a sufficient time may prove [the taking]." *Ibid.*

The facts here are analogous to the facts of the first and second *Portsmouth Harbor* cases. The Corps' temporary and irregular operational decisions, like the limited number of shots fired over the *Portsmouth Harbor* claimant's land, were isolated events rather than part of an established pattern of governmental action that permanently burdened private land. Conversely, the steps toward permanency the government allegedly took in *Portsmouth Harbor III* have no counterpart here; indeed, by deciding not to permanently amend the Manual after preparing the Environmental Assessment, the Corps affirmatively demonstrated its lack of intent to make a permanent change.

b. Petitioner suggests that the court of appeals simply deferred to the government's label for the Corps' operational decisions, and that the government could improperly exploit this Court's distinction between temporary and permanent flooding simply by labeling its actions as temporary. Pet. Br. 3, 44, 47; see Pet. App. 171a (Moore, J., dissenting from the denial of rehearing en banc). But that is not what the court of appeals did. And it is for lower courts, and ultimately for this Court, to determine whether governmental action constitutes a taking. Cf. *Baltimore & Ohio R.R.* v. *United States*, 298 U.S. 349, 364 (1936) ("As the Congress itself could not be, so it cannot make its agents be, the final judge of its own [takings] power under the Constitution.").

Here, it was the substance of the irregular deviations and the decisions surrounding them, not some superficial label for the Corps' actions, that established that any flooding resulting from the deviations was temporary

and not a taking. The Manual provides for such temporary deviations under appropriate circumstances (see J.A. 527-530), and the Corps approved deviations that were limited in duration, varied in the concerns they were devised to address, and varied as to the time of year when the deviation occurred. See pp. 6-8, *supra*; Pet. App. 6a-13a; *id.* at 169a (Dyk, J., concurring in denial of rehearing en banc) ("[T]his was a situation in which there was genuine uncertainty about the nature of the policies from year to year as the Corps responded to individualized concerns and individualized circumstances over (in the aggregate) a short period of time. The government's actions and the surrounding context demonstrate that the policies were temporary and not inevitably recurring.").

B. Even If The Temporary Nature Of The Flooding Here Does Not Defeat Petitioner's Claim, An Analysis Of Other Factors As Well Establishes That The United States Did Not Take Petitioner's Property

This Court should, as the court of appeals did, resolve this case by applying the settled rule that temporary flooding is not a taking. But if the Court departed from that rule, or declined to apply it here, a full analysis of other factors as well would equally compel the conclusion that the Corps' flood-control activities did not take petitioner's floodplain lands.

1. A takings claim based on flooding of private lands downriver of a government project would be subject to an ad hoc factual analysis, not a per se analysis

a. A permanent physical occupation of private property by the government or its designee is a taking per se. *Loretto*, 458 U.S. at 434-435. But as explained above:

> [T]his Court has consistently distinguished between flooding cases involving a permanent physical occupation, on the one hand, and cases involving a more temporary invasion, or government action outside the owner's property that causes consequential damages within, on the other. A taking has always been found only in the former situation.

Id. at 428. If, however, the Court were to depart from that principle, as petitioner requests, then it would be appropriate to regard the flooding petitioner claims as at most a form of physical invasion of petitioner's property (albeit not a permanent *occupation* amounting to a per se taking), and accordingly look to a range of considerations to decide whether petitioner's property was taken. See *id.* at 432 ("[This Court's] cases state or imply that a physical invasion is subject to a balancing process," even though "a permanent physical occupation would [n]ever be exempt from the Takings Clause."). Petitioner itself endorses such a flexible framework, under which the Court would "engag[e] in * * * [an] essentially ad hoc, factual inquir[y]," *Penn Central*, 438 U.S. at 124. See Pet. Br. 26-27, 29-30, 36-37, 40; Pet. 15-16, 23.

That approach would be consistent with this Court's cases. "As has been admitted on numerous occasions, this Court has generally been unable to develop any set formula for determining when justice and fairness require that economic injuries caused by public action must be deemed a compensable taking." *Monsanto*, 467 U.S. at 1005 (internal quotation marks and citations omitted); see also *Penn Central*, 438 U.S. at 124; *Hodel* v. *Virginia Surface Mining & Reclamation Ass'n*, 452 U.S. 264, 295 (1981); *Kaiser Aetna* v. *United States*, 444 U.S. 164, 175 (1979). Thus, except in "extraordinary circumstance[s]" presented only in "relatively rare situations," *Lucas* v.

South Carolina Coastal Council, 505 U.S. 1003, 1017-1018 (1992), courts are to evaluate each takings claim based on its specific facts.[6]

b. Petitioner's amici argue instead that the standards articulated in this Court's flooding cases should be jettisoned in favor of a per se rule that any flooding resulting from the operation of a government project is a taking. See Wash. Legal Found. Amicus Br. 19-23; Owners' Counsel Amicus Br. 5-11; Pac. Legal Found. Amicus Br. 6-18, 27-30; Nat'l Fed'n of Indep. Bus. Amicus Br. 6-17; Wolfsen Amicus Br. 27-31. There is no support for such an approach.

First, *Loretto* makes clear that flooding resulting from operation of a government project is not a per se taking unless it entails a permanent physical occupation. "[W]hen [a] physical intrusion reaches the extreme form of a permanent physical occupation, a taking has occurred. In such a case, 'the character of the government action' not only is an important factor in resolving whether the action works a taking but also is determinative." 458 U.S. at 426 (quoting *Penn Central*, 438 U.S. at 124). *Loretto* particularly emphasizes cases of permanent inundation by floodwaters—as distinguished from other forms of flooding, like that claimed here—in explaining the principle that only "a permanent physical occupation" of property is a per se taking. See *id.* at

[6] Petitioner invites this Court to remand the case to the court of appeals to decide the ultimate question whether a taking occurred here. Pet. Br. 21, 49; Pet. 1, 22-23. The Court should not follow that course because it would unnecessarily prolong this litigation and disserve the orderly development of the law. In particular, if the Court were to depart from or qualify the distinction between temporary and permanent flooding that has functioned well for nearly a century, then it ought to illustrate for lower courts the correct approach, rather than simply directing the court of appeals to consider (as petitioner suggests) "all the facts and circumstances," Pet. 1.

428.[7] Conversely, *Loretto* explains that government invasions of private property that amount to less than a complete occupation of the land are not subject to per se takings analysis. See *id.* at 433 (explaining that the taking in *Kaiser Aetna*, *supra*, "was not considered a taking *per se*" because it involved an "easement of passage, not * * * a permanent occupation of land"); *id.* at 434 (describing *PruneYard Shopping Center* v. *Robins*, 447 U.S. 74 (1980), as "[a]nother recent case underscor[ing] the constitutional distinction between a permanent occupation and a temporary physical invasion," under which physical invasion is not per se "determinative"). Here, of course, petitioner does not contend that its land was completely occupied by the government.

Second, petitioner's amici's analogies between this case and cases involving a direct physical occupation are inapt. In those cases—such as *Loretto* and *Kimball Laundry*—the government itself (or its designee) physically occupied private property. Such "direct government appropriation or physical invasion of private property" is uniquely disruptive to the landowner's property right, and therefore it is the "paradigmatic taking requiring just compensation." *Lingle* v. *Chevron U.S.A. Inc.*, 544 U.S. 528, 537 (2005). In the flooding cases, by contrast, only water enters onto property, and (with the possible exception of backwater that can be regarded as part of the project) it is not sensible to regard the water as being an occupation by the government. Rather, the water originates from natural sources, and in the present context, any flooding of a downstream riparian parcel is typically the consequence of government action outside,

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[7] This Court has, of course, recognized another category of per se taking (*viz.*, governmental action that renders property permanently valueless, a claim not made here). But the Court has drawn a line there. See, *e.g.*, *Lingle* v. *Chevron U.S.A. Inc.*, 544 U.S. 528, 538 (2005).

and not specific to, that parcel, much like general governmental regulation of the use of private property. Here, for example, the government activity that petitioner challenges occurred over 100 miles upriver from petitioner's lands.

Finally, a per se rule that there is a taking whenever flooding occurs is far "too blunt an instrument," *Tahoe-Sierra*, 535 U.S. at 342 (quoting *Palazzolo* v. *Rhode Island*, 533 U.S. 606, 628 (2001)), to evaluate an issue as complex as downstream flooding resulting from the operation of a dam. If the temporary character of flooding is not sufficient to conclude that a taking has *not* occurred, then such a claim should at least be evaluated in light of a number of factors: the reasonable expectations of a riparian owner in the claimant's situation, the magnitude of the flooding resulting from the project relative to pre- or post-dam natural flooding, the duration of the flooding, the benefits conferred on the claimant and other landowners by the government's water management, the reasons for and extent of deviation from the dam's normal plan of operation, the nature and directness of the harm to the claimant, and so on.

At bottom, petitioner's amici's arguments for a per se taking here rest on the same sort of flawed syllogism advanced by the claimants—and rejected by this Court—in *Tahoe-Sierra*: *First English* established that a temporary taking, like a permanent taking, requires compensation; *Pumpelly* established that a permanent taking by permanent flooding always requires compensation; therefore, temporary flooding always requires compensation. Even setting aside the obvious contradiction between amici's conclusion and the holdings of the Court's flooding cases, amici's reasoning sidesteps the very question presented in this case: how to decide whether temporary flooding is a taking to begin with.

See pp. 30-32, *supra* (explaining similar error in petitioner's reasoning); Br. for Resps. at 17-18, *Tahoe-Sierra*, *supra* (No. 00-1167) (explaining the flaw in the similar syllogism advanced by the claimants there). As in *Tahoe-Sierra*, the Court should decline to apply a per se taking approach here.

2. The circumstances of this case weigh strongly against finding a taking

Full consideration of a range of factors, as petitioner urges, confirms that petitioner has failed to establish a taking of a flowage easement over its floodplain lands.

a. As a riparian owner of floodplain lands, petitioner could have only limited expectations about the timing and volume of water flows on the River

This Court has consistently held that a taking generally will not be found if the landowner cannot reasonably expect to use its property in the manner interfered with by the challenged governmental action. See, *e.g.*, *Penn Central*, 438 U.S. at 124 (giving substantial weight to the "extent to which the regulation has interfered with distinct investment-backed expectations"); *Lucas*, 505 U.S. at 1027-1029 (noting that "the property owner necessarily expects the uses of his property to be restricted" under, for example, "background principles of the * * * law of property and nuisance").

Here, petitioner could have had no reasonable expectation that its property would not be subject to floods like the ones it experienced in the 1990s. Petitioner's property has been subject to considerable flooding—including during the growing-season periods petitioner focuses on—before the Dam was built, after the Dam was built, before the deviations at issue here, during the deviations, and after the deviations. Pet. App. 7a, 14a-15a,

59a-60a & n.9; J.A. 435, 444, 449, 598, 687. Yet petitioner's complaint, at bottom, is merely that its property, lying in a floodplain, was flooded. Petitioner's land, like most riparian land, is subject to the vicissitudes of nature and upstream factors that may influence the volume and timing of water flows on the River. No landowner in petitioner's position has a vested property right to have its land wet on particular days of the year and dry on others, or to have its land drain on a predictable schedule after it floods. That is particularly true in a "riparian rights" water-law jurisdiction, like Arkansas, that generally recognizes no rights in riparian landowners to a flow of particular volumes of water at particular times. See, *e.g.*, *Harris* v. *Brooks*, 283 S.W.2d 129, 133 (Ark. 1955).

Nor could petitioner have had a reasonable expectation, much less a property right, that assured it of compensation for temporary flooding on the WMA. The distinction between temporary and permanent flooding was firmly established in this Court's Just Compensation Clause cases long before the Dam was built or petitioner acquired the land constituting the WMA. Nor could petitioner have had a reasonable expectation that the Corps would not operate the Dam in a way that would temporarily flood the WMA, because the Manual provides for the deviations that occurred here, Pet. App. 5a-6a; J.A. 527-530. The situation here thus contrasts with the practice of the cable television companies in *Loretto* of paying an annual royalty to landowners to whose apartment buildings their equipment was attached, and the building owners' expectation of receiving that royalty. See 458 U.S. at 423.

b. Flood control, like other government responses to forces of nature, permissibly adjusts the benefits and burdens of water to serve the public good

The operational decisions the Corps made, and that petitioner claims took its property, were in large measure intended to manage the impact of downstream flooding on the River. For example, in several years, the Corps' deviations substantially reduced injury to farmers by giving them time to harvest their crops. See Pet. App. 6a-13a. More generally, the Dam's aggregate benefits, extrapolated over its lifetime, easily rank in the hundreds of millions of dollars. See J.A. 502, 504. While the relatively small group of landowners upriver of the Dam who lost their land to backwater inundation bore a distinct and significant permanent burden, and were justly compensated (see J.A. 493), the mass of downstream landowners like petitioner are properly regarded as members of the public affected by a flood-control program designed to adjust "the benefits and burdens of [riparian] life to promote the common good." *Penn Central*, 438 U.S. at 123-124.

Adjustments to such a program to optimize its effects may somewhat shift the benefits and burdens of the program among some downstream property owners. But such adjustments do not benefit the government itself (compare *Loretto*, 458 U.S. at 432 n.9), and they are ordinarily modest. Here, for example, the Corps' deviations shifted the River's stage at Corning by at most a few feet, on a few days, during a few months, in certain years. See J.A. 655-662 (plots comparing observed river stage at Corning with computer-model prediction of river stage at Corning in the absence of deviations); J.A. 607-611 (explaining plots). Such adjustments are ordinary and beneficial acts of government, and should not be held to constitute a taking, for "[g]overnment hardly could go

on if to some extent values incident to property could not be diminished without paying for every such change in the general law." *Pennsylvania Coal Co.* v. *Mahon*, 260 U.S. 393, 413 (1922); accord *Lingle*, 544 U.S. at 538.

Flood control in general, and the Corps' operational decisions here in particular, belong to a class of government activities designed to mount the best possible response to the sometimes-unfriendly forces of nature. Such responses, so long as they are reasonable, do not effect a taking. See, *e.g.*, *Lucas*, 505 U.S. at 1029 n.16 (noting that "destruction [by the government] of 'real and personal property, in cases of actual necessity, to prevent the spreading of a fire' or to forestall other grave threats to the lives and property of others" is not a taking) (quoting *Bowditch* v. *Boston*, 101 U.S. 16, 18-19 (1880); citing *United States* v. *Pacific R.R.*, 120 U.S. 227, 238-239 (1887)).

In *Miller* v. *Schoene*, 276 U.S. 272 (1928)—a case of more direct and dramatic injury to trees than that at issue here—this Court held that Virginia did not take the claimant's cedar trees when it enacted a statute resulting in an order to cut them down to prevent the spread of a plant disease that threatened nearby apple orchards. The Court reasoned that when "the [government] [i]s under the necessity of making a choice between the preservation of one class of property and that of the other," it "does not exceed its constitutional powers by deciding upon the destruction of one class of property in order to save another." *Id.* at 279. *A fortiori*, if one assumes (as petitioner does) that the Corps' deviations were (1) in response to farmers' need not to have their fields flooded before their crops were harvested, and (2) made with an awareness that petitioner might suffer some incremental adverse consequences, then the Corps' deviations simply reflect a decision to preserve some benefit for one class

of property (the farmers') while adversely affecting another (petitioner's) in releasing the massive volume of water impounded behind the Dam.

Moreover, the Court explained that in *Miller*, "[i]t would have been none the less a choice if, instead of enacting the * * * statute, the state, by doing nothing, had permitted serious injury to the apple orchards." 276 U.S. at 279. That principle applies here with even greater force because, with the Dam in place, the Corps could not have stood idle and allowed nature to take its course (as Virginia might have in *Miller*); every day since the Dam was built, the Corps has had to decide whether and how much water should be released from the Lake. The fact that its decisions were different for some months in the 1990s than they had been before, with consequences for the benefits and burdens on downstream riparian landowners, does not transform the Corps' operational adjustments into a taking.

c. The operation of the Dam resulted in, at most, incrementally longer flooding on petitioner's lands

This Court has long held that, outside of per se takings, deciding when to recognize a taking presents "a question of degree." *Pennsylvania Coal*, 260 U.S. at 416. With respect to flooding in particular, the Court has recognized that flooding of any kind must be sufficiently substantial to warrant treatment as a taking. See, *e.g.*, *Danforth* v. *United States*, 308 U.S. 271, 286-287 (1939) (rejecting a takings claim based on the construction of a levee that channeled additional floodwaters onto the claimant's floodplain lands because it did not create "a burden, actually experienced, of caring for floods greater than it bore prior to the construction," and explaining that "the retention of water from unusual floods for a somewhat longer period or its increase in depth or de-

structiveness by reason of the set-back levee" is not a taking); *Bedford*, 192 U.S. at 224-225 (holding that, even if increased flooding resulted from a revetment constructed by the government to slow down erosion of the river bank, the flooding on the claimant's property was at most "an incidental consequence," not a taking). And, of course, to be a taking, the flood must be actually and proximately caused by the government and properly attributable to it. See, *e.g.*, *Sanguinetti*, 264 U.S. at 149-150. Here, the CFC seriously erred in analyzing the critical factual questions of whether and to what extent the Corps' actions increased the burden of flooding on petitioner's lands.

i. There are pervasive flaws in the Court of Federal Claims' analysis of the causation evidence

The WMA begins 115 miles downriver of the Dam. A thousand square miles of watershed drain into the River below the Dam and above the WMA—a larger area than all of the watershed above the Dam. See p. 4, *supra*. That separation, and the resulting opportunity for intervening causes and effects, coupled with the fact that the WMA has always experienced extensive growing-season flooding (see p. 5, *supra*), makes it far from "simpl[e]" (Pet. Br. 30) to say what effect particular operations at the Dam had on flooding on the WMA.

In particular, petitioner needed to show at trial that the Corps' deviations at the Dam caused an incremental increase in the number of days each year that the affected parts of the WMA were inundated, relative to the situation that would have obtained had the Corps adhered to the normal regulation flows provided in the Manual. That is a challenging showing to make because the deviations and normal regulation flows were, of course, not described in terms of their effect on the

WMA, nor even in terms of their effect on the River anywhere near the WMA (*e.g.*, at the Corning gauge). Rather, the operational targets for the Dam were described in terms of the stage of the River at the Poplar Bluff gauge, some 83 miles upriver of the WMA.

Petitioner's and the CFC's analysis of the connection between deviations at Poplar Bluff and flooding on the WMA was fundamentally flawed. The CFC relied on petitioner's expert witnesses, who based their opinions on comparisons between historical measurements of the River's stage at the Corning gauge in 1981-1992 (before the deviations) and measurements in 1993-2000 (during the deviations). See Pet. App. 60a-62a; see also J.A. 460-463. Those witnesses reasoned that because the Corning gauge registered five feet or higher—a level at which water would enter the WMA—on more days during the deviation years than during the preceding decade, the deviations must have caused flooding. That oversimplified and limited analysis mistakes correlation for causation because it fails to control for other variables affecting the River. The most obvious ignored variable is precipitation. The 1000 square miles of natural runoff that the River collects below the Dam significantly affects the River's stage at the Corning gauge. J.A. 238-239, 243-247, 582-583. A five-foot stage at Corning on a given day in July could be the result of releases from the Dam, but it could equally be the result of rain falling in the watershed downstream of the Dam.[8]

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[8] Petitioner states that its experts found "no statistical difference in precipitation data between the pre- and post-deviation periods." Pet. Br. 12; see J.A. 124, 179. But petitioner's experts made no effort to analyze the *timing* of the rain or account for variability in rain *distribution* across the 1900 square miles of watershed. Those are important matters because, for example, a single heavy storm could raise the River's stage sharply and flood the WMA, with water draining

Worse yet, simply inventorying the number of days the River is above a certain stage (as petitioner's experts did) does not answer the question of when the relevant areas of the WMA were inundated, because riparian land takes time to drain after a river crests; consequently, a small number of evenly spaced high-water days may leave land continuously inundated in a way that a cluster of high-water days may not. J.A. 300-303, 444, 611-615. The correct approach would be to ask what would have happened to the River's stage near the WMA had the deviations not occurred (while keeping other factors from the 1993-2000 period constant), and then to translate river stages into duration of inundation, taking into account drainage rates. The government offered expert testimony on the first step through a computer simulation of what would have happened in terms of river stages between 1993 and 2000 absent the deviations. Pet. App. 62a-63a; J.A. 191-222, 230-236, 604-611. Then for the second step, the government adopted petitioner's experts' assumptions about drainage time in the WMA to translate the simulated river stages into duration of inundation. See Pet. App. 111a-112a; J.A. 250-251, 265-281, 604-611, 620-622, 640-642. The government's experts' conclusion was that "there would have been significant periods of timber inundation even in the absence of the Corps' deviations." Pet. App. 112a (quotation marks omitted); J.A. 260-284, 333-336, 604-611, 620-623, 640-642.

The CFC nonetheless accepted petitioner's experts' testimony. The court concluded that the "River experienced more high water during the growing seasons from

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and moving downstream quickly, while a series of smaller storms could keep the River at a moderately high stage and the WMA inundated for an extended period.

1993 to 1999, *i.e.*, the period of [deviations], than it experienced during previous time periods." Pet. App. 107a. But that observation, standing alone, says nothing about whether (or to what extent) the Corps' deviations actually *caused* the high water. By contrast, the government's experts' computer model addressed that factual question, which was key to petitioner's takings theory. Yet the CFC rejected that evidence without offering a sound reason for doing so. The court's apparent rationale for rejecting the model—that it "should [not] be employed to displace actual observations" of high water in the WMA in the 1990s, *id.* at 113a—misunderstands that the very purpose of the model was to supply a scientifically grounded prediction for what could *not* be observed, that is, what the river stages in the 1990s would have been in the absence of the Corps' deviations.

ii. Even accepting the Court of Federal Claims' erroneous findings, the additional flooding caused by the Corps was slight

Even accepting (as the CFC apparently did) petitioner's account of the increased flooding on the WMA, the additional number of days of flooding during the growing season was too insubstantial to support the CFC's determination that a flowage easement was taken here. All agree that the River regularly flooded land along its banks before the Dam was completed in 1948, and that the WMA has long been (and continues to be) subject to flooding at various times of the year. Pet. App. 7a, 14a-15a, 59a-60a, 106a; J.A. 435, 444, 449, 598, 687. Petitioner's claim therefore depends on the proposition that any *incremental* flooding was a taking. Even accepting petitioner's experts' approach, the increment here was slight. That weighs sharply against finding a taking.

The CFC found that the WMA flooded when the River reached 4.5 to 6 feet at Corning, and the CFC used 5 feet as the threshold level. Pet. App. 60a-61a. The CFC noted that the trees' full growing season was April 4 to October 11, Pet. App. 60a, and petitioner's expert testified that the most "critical months" of that season for the trees on the WMA were June, July, and August, J.A. 122. Using those parameters to apply petitioner's experts' analytical approach to data from the Corning gauge, the most that can be said is that, on average, the WMA was flooded in any event a dozen or so days each month, and adjustments to the Dam's operation increased that flooding by a few days per month. See pp. 9-10, *supra*; App., 1a-3a, *infra*; J.A. 449, 463.

Petitioner nonetheless claims that these data show that the flooding "was a very significant and unique change." Br. 11. But even if the flooding turned out to be a "significant * * * change" insofar as it affected the metabolism of the trees on the WMA's floodplain lands (see Pet. Br. 10-13), what matters under the Just Compensation Clause is that the few additional days of flooding are merely a "somewhat longer period" of flooding, *Danforth*, 308 U.S. at 286, than petitioner's land already experienced, and hence did not work a material change in the basic character of the property that could support a takings claim.[9]

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[9] Petitioner asserts, without explanation, that the flooding "preempted [its] use and enjoyment of its property." Pet. Br. 45. There is no evidence in the record to that effect. Petitioner continued to conduct timber sales. J.A. 567-573; see J.A. 79-81, 92-94. And there is no evidence that the flooding preempted (or even affected) the use of the WMA for fall and winter duck hunting, undertaken on land that petitioner intentionally floods every winter. Pet. App. 42a, 44a. Nor is there evidence that flooding affected the presence of wildlife (which would not, in any case, be a protected property interest). Although the

d. The effect of the deviations on petitioner's lands was limited in time, highly indirect, and reflected only consequential damage

The effect the CFC found the deviations had on petitioner's floodplain lands bears the hallmarks of consequential injuries that this Court has consistently recognized do not rise to the level of a taking. The deviations were temporary, irregular, limited to particular times of the year, and occurred separately over a span of only six years. Even if the temporal features of flooding are not dispositive in the flooding context, they are surely relevant to whether a taking has occurred. Cf. *Lingle*, 544 U.S. at 538-539 (explaining that a "permanent physical invasion" is a taking, but lesser invasions are examined under the multi-factor standards set forth in *Penn Central*); *Tahoe-Sierra*, 535 U.S. at 342 ("[T]he duration of [a temporary land-use] restriction is one of the important factors that a court must consider in the appraisal of a regulatory takings claim.").

Moreover, any resulting flooding was the indirect and incidental consequence of the deviations. The Corps' operational decisions in no way targeted petitioner or its lands; water released from the Dam during the deviations traveled 115 miles, over six or more days, before it (and water from other sources) reached petitioner's

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CFC stated that the flooding prevented petitioner from using "certain regions" of the WMA for the purpose of "providing habitat for wildlife," Pet. App. 92a; see Pet. Br. 15-16, the CFC based that finding on nothing but petitioner's expert report ascribing a dollar value to timber losses, Pet. App. 92a (citing J.A. 390-392), and petitioner in turn cites only the CFC's opinion. Of course, it is possible that "extended inundation could result in adverse impacts to species composition and habitat deterioration," J.A. 719, but a bare assertion without evidence that habitat consequences affected particular uses of petitioner's property does not prove a taking.

property, potentially affecting any riparian property along the River. Pet. App. 3a; J.A. 239-240. Some landowners were benefitted (Pet. App. 6a-13a) while others may have been disadvantaged, but petitioner was not forced to bear a unique burden. See *Palazzolo*, 533 U.S. at 617-618; *Penn Central*, 438 U.S. at 124.

The ultimate effect on petitioner was still more indirect because petitioner's true quarrel with the Corps' operational decisions is not that they substantially affected some intrinsic attribute of the land itself (which was already subject to periodic flooding) but rather that they harmed petitioner's trees. See, *e.g.*, Pet. App. 2a (noting that CFC awarded damages based on value of timber). As even petitioner's abbreviated discussion (Br. 10-15) of biology and silvaculture illustrates, that harm further depends on the long-term effects that particular delays in flood drainage at particular times in the growing season had on particular species of trees at particular elevations. Even if operational decisions at the Dam in 1993 had an effect the following decade on trees over 100 miles away, that effect can only be described as "in its nature indirect and consequential," *Sanguinetti*, 264 U.S. at 150, and therefore is not compensable as a taking.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

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Table 3. Flooding characteristics of the Black River near Corning, Arkansas 1939-2004.

	1939-48	1949-92	1993-99	2000-04
Flooding >6'				
Days in growing season	50.60	64.70	91.14	55.60
Days in dormant season	54.80	77.80	100.43	65.80
# Pulses	6.00	5.20	5.43	7.40
$\bar{x}$ Days/pulse	18.70	31.70	35.29	17.20
Number years	10.00	44.00	7.00	5.00
Flooding >5'	1939-48	1949-92	1993-99	2000-04
Days in growing season	54.30	68.45		58.80
Days in dormant season	61.10	82.86	108.86	70.00
# Pulses	6.30	5.64	5.00	7.20
$\bar{x}$ Days/pulse	18.32	26.85	41.26	17.89
Number years	10.00	44.00	7.00	5.00

Table from J.A. 449

Monthly average (over 6.25 month growing season) of **orange** highlighted entry is 11.0 days
Monthly average (over 6.25 month growing season) of **blue** highlighted entry is 15.6 days

Table 6. Average days at various Black River gauge heights at Corning, Arkansas.

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
5-6 Feet								
81-92	4.25	2.33	2.25	5.25	1.58	1.33	2.92	1.17
93-99	1.43	2.86	3.14	3.14	0.43	0.29	1.29	0.67
6-8 feet								
81-92	5.00	3.25	4.08	4.75	4.92	4.58	3.58	4.42
93-99	4.57	4.00	6.00	4.43	2.29	4.00	5.43	2.67
8-10.5 feet								
81-92	7.00	7.17	8.83	0.92	0.00	0.08	0.58	5.08
93-99	11.00	12.43	14.14	6.00	1.29	0.43	1.29	5.00
10.5-11.5 feet								
81-92	8.17	7.00	1.67	0.00	0.00	0.00	0.42	1.33
93-99	8.29	6.57	0.43	0.14	0.71	0.00	0.00	1.67
11.5 feet								
81-92	2.50	1.33	0.00	0.00	0.00	0.00	0.33	0.92
93-99	2.71	2.43	0.00	0.00	0.57	0.14	0.29	1.67

Table from J.A. 463

Monthly average of corangehighlighted entries is 11.4 days
Monthly average of blue highlighted entries is 14.2 days

2a

Table 6. Average days at various Black River gauge heights at Corning, Arkansas.

Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
5-6 Feet								
81-92	4.25	2.33	2.25	5.25	1.58	1.33	2.92	1.17
93-99	1.43	2.86	3.14	3.14	0.43	0.29	1.29	0.67
6-8 feet								
81-92	5.00	3.25	4.08	4.75	4.92	4.58	3.58	4.42
93-99	4.57	4.00	6.00	4.43	2.29	4.00	5.43	2.67
8-10.5 feet								
81-92	7.00	7.17	8.83	0.92	0.00	0.08	0.58	5.08
93-99	11.00	12.43	14.14	6.00	1.29	0.43	1.29	5.00
10.5-11.5 feet								
81-92	8.17	7.00	1.67	0.00	0.00	0.00	0.42	1.33
93-99	8.29	6.57	0.43	0.14	0.71	0.00	0.00	1.67
11.5 feet								
81-92	2.50	1.33	0.00	0.00	0.00	0.00	0.33	0.92
93-99	2.71	2.43	0.00	0.00	0.57	0.14	0.29	1.67

Table from J.A. 463 Monthly average of orange highlighted entries is 14.7 days
Monthly average of blue highlighted entries is 17.3 days

REPLY BRIEF

No. 11-597

In the Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITIONER'S REPLY BRIEF ON THE MERITS

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ARGUMENT

The Commission seeks to apply the physical takings analysis, not a regulatory analysis like the *Penn Central* framework, that this Court established in flooding decisions like *Pumpelly* and *Cress* and continued to apply in a long line of flooding and nonflooding cases including *Dickinson*, *Causby*, and *Loretto*. *See* Pet. Br. 21, 26, 27, 36. The physical takings analysis in this Court's decisions looks to whether the government has taken action, the direct result of which is a physical invasion that substantially intrudes on a protected property interest. *See* Pet. Br. 26-27, 36. Where such is the character of the invasion, the Takings Clause guarantees just compensation.

Despite the United States' attempts to portray it as extreme and radical to apply this Court's physical takings analysis to both permanent *and* temporary flood invasions, the reality is that doing so is fair and faithful to precedent. The nation's entire flood control and irrigation systems cannot possibly be seen as built and functioning entirely in reliance on isolated statements in this Court's decisions in *Cress* and *Sanguinetti*. None of those systems ground to a halt when the Federal Circuit held the United States liable in 1987 for taking timber through temporary flood invasions, or when this Court found liability for temporary flood invasions in 1947. *See United States v. Dickinson*, 331 U.S. 745, 751 (1947); *United States v. Cooper*, 827 F.2d 762, 763-64 (Fed. Cir. 1987). Nor will anything like that happen here if the Federal Circuit's decision in this case is reversed, or if the Court of Federal Claims' judgment is subsequently affirmed in line with *Cooper*.

If the Federal Circuit's decision stands, the Commission will suffer the uncompensated and *permanent* change in the condition of its Management Area, the *permanent* loss of ecologically important timber and habitat, and face the future threat of further destruction. And such an exemption of government-induced flooding threatens additional bottomland hardwood ecosystems and other important land uses. The Federal Circuit's absolute exemption for temporary floods simply has no fair justification.

Nowhere in its brief does the United States acknowledge the destruction its temporary flood control actions can cause. It redirects attention to itself and inflates its concerns with new self-serving testimony from the Corps of Engineers that is not anywhere in the record, while avoiding any direct mention of the damage its flood invasions inflicted on the Commission. It abstracts the undisturbed facts and injects the argument of counsel to defend the Corps' actions. Using a classic method of defending the indefensible, the United States supplants facts with "euphemism, question-begging and sheer cloudy vagueness" so as "to name things without calling up mental pictures of them." George Orwell, *Politics and the English Language*.

In the United States' phraseology:

- The United States' flood invasions here did not permanently destroy or damage millions of board feet of timber and important wildlife habitat; the United States merely "influenced the character of the natural vegetation." *Compare* J.A. 361-98 *with* Resp. Br. at 29.

- The United States did not cause "extreme" and "substantial" flooding like its own expert testified; it caused "incrementally longer periods of flooding," or "a few additional days of flooding," or "merely a 'somewhat longer period of flooding.'" *Compare* Pet. App. 89a, 111a *and* J.A. 338-42 *with* Resp. Br. at 8, 51.

- It is not relevant to the character of the invasion that the United States' extreme and unprecedented flooding caused permanent destruction in the face of specific objections and warnings; "the character of the invasion in this context is the same whether the floodwaters arrive by natural forces or human intervention: the land floods, and the flood abates." *Compare* Pet. App. 7a-8a, 49a-50a, 88a-89a, 98a-99a, 107a-109a *and* J.A. 59-66, 123-24, 174-75, 338-42, 467-75 *with* Resp. Br. at 29.

- The United States did not make a series of related deviation releases for eight consecutive years resulting in extensive, sustained growing season flooding that caused permanent damage and destruction; the water simply originated from "natural sources" and placed a "temporary burden" on the Commission as a result of dam operations. *Compare* Pet. App. 55a-57a, 61a-62a, 88a-89a, 106a-109a *with* Resp. Br. at 30, 40.

The full, detailed, and undisturbed factual findings of the Court of Federal Claims—which this Court need not review to answer the Question Presented—establish a taking under the physical takings analysis.

I. Applying The Physical Takings Analysis To Flood Invasions Is Fair And Faithful To Precedent, Not Extreme And Radical.

The United States offers only two reasons for exempting temporary flood invasions that would not also exempt permanent flood invasions: (1) because the law has always been this way, and (2) because holding it potentially liable for temporary flood control would destroy its ability to conduct flood control operations. *E.g.*, Resp. Br. at 16, 27. The first reason cannot be supported without inflating dicta in a few cases while deflating numerous seminal holdings discussed in the Commission's opening brief. The second reason rests on the United States' strawman argument that the Commission and supporting amici advance a physical takings test of absolute liability. In truth, neither the Commission nor supporting amici advance any such absolute rule, and instead seek to apply the settled physical takings analysis that has been applied to all modes of invasion without slowing the wheels of government.

A. There is no long-standing, absolute rule that exempts temporary flood control actions from the Takings Clause.

To articulate a bright-line, categorical rule that absolutely exempts temporary flood control actions from the Takings Clause, the United States inflates isolated statements in *Cress*, *Sanguinetti*, and *Loretto* to subsume those cases' actual holdings. It then represents that it, lower courts, and Congress have always relied on those statements as definitively and forever exempting temporary flooding from the Takings

Clause. That view of the law is not tenable, as numerous cases have advised. Notably, the United States does not even acknowledge the Federal Circuit case that Judge Newman described as "binding precedent that directly contravenes" the panel majority's decision; *Cooper* awarded compensation for taking timber through increased seasonal flooding caused by a temporary (never meant to be permanent) stream blockage. *See* Pet. App. 35a (Newman, J., dissenting) (citing 827 F.2d at 763-64). The United States was on notice before its deviations began in 1993 that temporary flood control actions are not exempt from the Takings Clause. *See Cooper*, 827 F.2d at 764; *see also Nat'l By-Products, Inc. v. United States*, 405 F.2d 1256, 1273 (Ct. Cl. 1969) ("The distinction between 'permanent liability to intermittent but inevitably recurring overflows,' and occasional floods induced by governmental projects, which we have held not to be takings, is, of course, not a clear and definite guideline.")

Cooper is fully in line with this Court's precedents. Multiple times this Court has rejected an absolute rule that flooding which can be, or is, abated is exempt from the Takings Clause. *E.g.*, *Dickinson*, 331 U.S. at 751 (the temporary duration of the invasion did not defeat the takings claim even though the affected land had been reclaimed by the landowner prior to filing the claim). Indeed, that principle is consistent even in the authority that the United States cites to the contrary. *See, e.g.*, *United States v. Welch*, 217 U.S. 333, 339 (1910) (the government's flooding actions would still amount to a taking even if it ended the flooding because "a destruction for public purposes may as well be a taking as would an appropriation for the same

end"). *Cooper* is also faithful to this Court's seminal Takings Clause decisions in *Armstrong* and *Causby*. *See Armstrong v. United States*, 364 U.S. 40, 48 (1960); *United States v. Causby*, 328 U.S. 256, 258-59 (1946).

Although it offers new testimony from the Corps of Engineers—which is outside the record on appeal—that it does not acquire flowage easements for temporary floods (*see* Resp. Br. at 26), the United States has indeed acquired flowage easements downstream of flood control projects that it intends to use only in extreme flood events, if ever. *Compare Story v. Marsh*, 732 F.2d 1375, 1378, 1384 (8th Cir. 1984) (describing the Corps of Engineers' purchase of flowage easements below a levee system so that it could breach the levee if the Mississippi River reached a certain level) *with Big Oaks Farms, Inc. v. United States*, No. 1:11-CV-00275-NBF, slip op. at 15 (Fed. Cl. May 4, 2012) (citing the Federal Circuit's decision in this case and dismissing landowners' takings claim that the flooding from the Corps's 2011 breach of the levee system exceeded its flowage easements and caused permanent damage because "plaintiffs' claim is based on a single flood that has since receded").

The Court of Federal Claims' trial judgment for the Commission does not detract from this Court's decisions in *Cress*, *Sanguinetti*, or *Loretto*. Those cases continue to stand for important rules. *Cress* holds that flooding which is shown to be inevitably recurring is a taking; the fact that such flooding may not be a permanent occupation both temporally and spatially is "no difference in kind, but only of degree." *Cress v. United States*, 243 U.S. 316, 328 (1917). The United States' attempt to expand the phrase "inevitably

recurring overflows" is unpersuasive as the phrase does not mean that flood invasions must be permanent in duration to warrant compensation. *See* Wash. Legal Found. et al. Amicus Br. at 13-14 (noting that *Webster's New Collegiate Dictionary* defines "inevitable" as "incapable of being avoided or evaded" and does not refer to events that will recur for all time). Rather than foreclose the possibility of temporary flood takings, the Court in *Cress* acknowledged the now-settled physical takings test as the proper means for determining whether a taking has occurred, stating "it is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines whether it is a taking." *Cress*, 243 U.S. at 328.

Sanguinetti continues to stand for the rule that a landowner cannot prevail on a flood-based takings claim without proving its damages, causation, or forseeability. *Sanguinetti v. United States*, 264 U.S. 146, 149-50 (1924). That being the basis for the Court's holding, any reference in *Sanguinetti* to the duration of the flooding is mere dicta. *See* Pet. Br. at 18; Cert. Reply Br. at 4-5. And unlike here where the recurring and sustained flooding was attributable to affirmative water releases during normal operating conditions—the deviations—any additional flooding there was speculative and, if anything, attributable to an insufficient canal despite the government's efforts to over-engineer it. *Sanguinetti*, 264 U.S. at 146-47.

Loretto establishes the rule that permanent occupation, no matter how small, will always effect a taking. *See Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 441 (1982) ("Our holding today is

narrow. We affirm the traditional rule that a permanent physical occupation of property is a taking."). *Loretto* never articulated an absolute rule that temporary flooding cannot result in a taking. In fact, though ignored by the United States, the Court in *Loretto* stated that interim flooding cases are subject to a "more complex balancing test." *Id.* at 435 n.12; *see also* Pet. Reply Br. *infra* at 17. The lengths to which the United States is forced to go to cobble together what is clearly dicta, especially given that the *Loretto* and *Cress* plaintiffs prevailed, to support its proposed rule underscores the fact that neither this Court nor—until now—the Federal Circuit has exempted temporary floods from the Takings Clause.

B. The physical takings test does not require the United States to pay just compensation for every temporary flood.

None of this Court's decisions applying physical takings law have held or suggested that the government effects a taking any time water enters someone's property. Nor has the Commission or any supporting amici argued for an absolute "per se rule that any flooding result[ing] from the operation of a government project is a taking." Resp. Br. at 39. Instead, the physical takings analysis in this Court's decisions holds the government liable when it takes actions, the direct result of which are flood invasions that substantially intrude on a protected property interest. *See* Pet. Br. at 26; *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1356 (Fed. Cir. 2003) (distinguishing between direct invasions and consequential damages by asking whether the floods are "the direct, natural, or probable result" of the

government action); *cf. also* Pac. Legal Found. et al. Amicus Br. at 20; Wash. Legal Found. et al. Amicus Br. at 16-17; Nat'l Fed. of Indep. Bus. et al. Amicus Br. at 17; Wolfsen Land & Cattle Co. et al. Amicus Br. at 28; Owners' Counsel of America Amicus Br. at 4-5.

A number of invasions, including floods, that might be traced to a government action do not satisfy this test:

- Flood damage from unprecedented rains that caused a government-constructed canal to overflow did not effect a taking because there was no proof that the value of the flooded property was impaired, that the overflow was the direct or necessary result of the canal, or that the flooding could reasonably be anticipated by the government. *Sanguinetti*, 264 U.S. at 149-50.

- Erosion damage that may have been less if revetments had not been constructed on river banks to prevent the navigable channel of the Mississippi River from receding did not constitute a taking because the object of the works was to preserve natural conditions and the damage was not the direct result of government action but was caused by the river's action over a course of years. *Bedford v. United States*, 192 U.S. 217, 225 (1904).

- Two guns that were test-fired from a fort battery over private property without impacting the land did not entitle the landowner to recovery under the Takings Clause because there was no

proof that the guns would ever be fired again. *Peabody v. United States*, 231 U.S. 530, 540 (1913); *see also Portsmouth Harbor Land & Hotel Co. v. United States*, 250 U.S. 1, 1 (1919).

- Damage to fruit trees was not the foreseeable result of government drilling four miles from the plaintiff's spring that hit water that ran into a lake along with unusually heavy snow runoff that caused an overflow of saltier water that, in turn, contaminated the spring from which plaintiffs irrigated with knowledge of its salty condition. *Columbia Basin Orchard v. United States*, 132 F. Supp. 707, 711 (Ct. Cl. 1955).

If the Federal Circuit on remand were to apply the physical takings analysis and ultimately affirm the Court of Federal Claims' judgment for the Commission, it would not at all mean that the United States must suddenly pay just compensation for every overflow of water that it is alleged to have caused. The Commission's case does not involve only trivial and unconnected floods like the United States' brief presents. For example, the United States characterizes "the size of the effect of the Corps' operational decisions" here as only adding a few days per month to the already flooded Management Area. Resp. Br. at 9-10. But this abstraction sterilizes the data and does not reflect the evidence at trial that the timing, extent, and duration of the flooding was unique, unprecedented, and did not emulate historical conditions. J.A. 83-84, 123-24, 174-75, 338-42, 435, 438-39, 460-64, 470-71, 472, 475, 485-86.

Flooding during the entire 1993-1999 growing seasons (April - October) resulted in an 89.5% increase in water levels on the Management Area of 8' to 10.5' and a 47.6% increase in levels over 11.5' as compared to the 1981-1992 period. J.A. 479-80. During the hottest months (June - September) in that same period, these levels saw an increase of 122.79% and 100%, respectively. J.A. 479-80. Both parties' experts agreed that the cumulative effect of multiple, consecutive years of growing-season flooding creates a problem. J.A. 111-13, 175, 332. The United States' own expert, Dr. Sammy King, testified that the Corps' deviations here, as expressed under the Corps' own model, did result in multiple consecutive years of "extreme" flooding because it lasted longer and occurred during some of the hottest months. J.A. 338-42. This flooding left in its wake an ecosystem in a state of collapse with tree mortality of 15-60% in the tracts affected by the flooding, as compared to an average annual mortality of less than 2% before the deviations. J.A. 113-14, 384; Pet. App. 137a. On the Part I study area, 104,119 of the 198,596 trees were dead or declining when Kingwood Forestry Services conducted its timber inventory at the end of 2000. *See* Pl. Exh. 485 at AGFC11549, Tr. 2368.

The United States' brief also mischaracterizes its deviations as "ad hoc," "independent," "temporary," and "discrete" decisions (*see, e.g.*, Resp. Br. at 12, 33-34) made "in response to *different* requests . . . for *different* times of the year . . . for *different* water releases to target *different* river stages at Poplar Bluff." Resp. Br. at 6 (emphasis added). In truth, the Corps' actions amounted to a "series of deviations" that resulted in a unique "pattern" of increased flooding on the

Management Area. Pet. App. 48a, 107a. The United States also rationalizes that the deviations all fall under the category of "planned deviations" as contemplated in the Clearwater Lake Water Control Manual "for specific activities that required deviations only for limited periods of time, such as the harvesting of crops, canoe races, and fish spawning." Resp. Br. at 6.

However, nearly all of the planned deviations adopted by the Corps between 1993 and 2000 were for considerable time periods and effectively extended the "deviating" throughout eight consecutive years.[1] Written authorizations for some of the "interim operating plans" indicate that the Corps was using these to "monitor the effectiveness" of the continued deviations to help it develop a permanent revision to the water control plan. *C.f.* Jt. Exh. 210, 215, 218, 236, 239. The common effect of these deviations was "controlled flooding" to an unprecedented and destructive degree across major portions of the Commission's Management Area. *See* J.A. 56, 404-15. The Corps admitted that the primary reason for these deviations and its efforts to permanently modify the

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[1] *See* Jt. Exh. 210-13, Tr. 368 (approving deviations from April 15, 1994 through April 15, 1995); Jt. Exh. 215-16, Tr. 368 (approving deviations from April 15, 1995 through April 15, 1996); Jt. Exh. 218-22, Tr. 368 (approving deviations from April 15, 1996 through April 14, 1997); Jt. Exh. 232-34, Tr. 368 (approving deviations from April 15, 1997 through "end of FY 97"); Jt. Exh. 236-37, 239-44, Tr. 368 (approving deviations from April 15, 1998 through Dec. 1, 1998); Jt. Exh. 246-47, Tr. 368 (approving deviations from Dec. 1, 1998 through Dec. 31, 1999); Jt. Exh. 248-53, Tr. 368 (approving deviations from May 15, 2000 through Dec. 1, 2000).

Clearwater Lake Water Control Manual was to benefit farmers who were planting low-lying acreage below Clearwater Dam. JA 351, 489, 687; *see* Pet. App. 48a.[2]

These undisturbed facts differ from those presented in *Sanguinetti*, *Bedford*, *Portsmouth*, and *Columbia Basin Orchard* on dispositive points. The Corps' pattern of deviations here caused significantly greater than normal flooding, not trivial flooding, that was foreseeable as the direct, natural, or probable result of the deviations, and that substantially intruded on the Commission's property interest.

C. The Court's physical takings test has not brought the wheels of government to a halt.

Raising the specter of a total collapse of the nation's flood control systems, the United States argues that "any retreat from that [permanent vs. temporary] distinction could be highly disruptive." *See* Resp. Br. at 27. Going further, it argues that the Takings Clause would force a "blind adherence to normal operating plans" and "cast in doubt the future of the

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[2] The evidence at trial showed that several members of Congress requested deviations on behalf of farmers and that the Corps felt that returning to normal operations would be difficult and perhaps "not an option" because of "political pressure." *See* Jt. Exh. 5, Tr. 1253-54; Jt. Exh. 240, 241; Tr. 1256; Pet. App. 185a, 189a. Notably, the American Farm Bureau Federation and numerous agricultural landowners have filed amici curiae briefs supporting the Commission's claim for just compensation. *See* Nat'l Fed. of Indep. Bus., et al. Amicus Curiae Br.; Wolfsen Land & Cattle Co. et al. Amicus Curiae Br.

government's long-running . . . programs of flood control (and other water management)." *See* Resp. Br. at 28. Such fears are wildly overblown; they have been raised in the past and rejected without crippling the government's ability to function.

In *Loretto*, the Court considered and rejected argument that applying the permanent physical occupation rule would have "dire consequences for the government's power to adjust landlord-tenant relationships." *Loretto*, 458 U.S. at 440. In *Causby*, the Court considered that treating every overflight as an invasion "would clog these highways, seriously interfere with their control and development in the public interest, and transfer into private ownership that to which only the public has a just claim." 328 U.S. at 261. It rejected those concerns as a reason to categorically exempt overflights. Since *Causby* was decided in 1946, the nation's system of air travel and temporary changes in flight patterns have in no way collapsed. In *Portsmouth*, the Court held that military guns could take property by shooting *over* someone's property. *Portsmouth Harbor Land & Hotel Co. v. United States*, 260 U.S. 327, 330 (1922). Even without a single shot ever landing on the owner's property, "a continuance of them in sufficient number and for a sufficient time" could effect a taking. *Id.* After *Portsmouth* was decided in 1922, the Takings Clause did not hamstring the nation's ability to provide for the common defense. The United States' flood control operations did not collapse after the Federal Circuit decided *Cooper* in 1987, and they will not collapse if the Court of Federal Claims' judgment here is affirmed on remand.

The United States' own brief explains that procedural laws like the National Environmental Policy Act ("NEPA") will tend to ensure that the government follows permanent flood control policies (*e.g.*, Resp. Br. at 21-22; Opp. Br. at 18).[3] Thus if the United States' contentions about laws like NEPA are actually true, then applying the Takings Clause here in line with settled precedent would be fair and just for landowners situated like the Commission without bringing the wheels of government to a halt.

II. Applying A Regulatory Takings Analysis To Flood Invasions Would Be A Dramatic Change Undercutting The Whole Body Of Physical Takings Law.

Replacing the physical takings analysis with a *Penn Central* regulatory analysis for the temporary flood invasions proven at trial would be an unprecedented shift with dangerous implications. A regulatory

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[3] Here, NEPA had no such effect. The Corps chose not to implement NEPA until after 5 years of deviations. As early as 1993, Corps officials were pursuing a "Plan of Action" to develop water control changes to the White and Black Rivers. *See* Jt. Exh. 211, 222; Pl. Exh. 266, Tr. 86-87. But the Corps did not prepare a draft Environmental Assessment until late 1999. Jt. Exh. 14, Tr. 204; Pl. Exh. 70, Tr. 202; *see also* 40 C.F.R.§ 1502.5 (requiring agencies to begin a draft environmental impact statement "early enough so that it can serve practically as an important contribution to the decision-making process and will not be used to rationalize or justify decisions already made"). Colonel Thomas Holden, the District Engineer and highest ranking official in the Little Rock District, ultimately admitted that "anyone could challenge us in that the deviations are not in compliance with NEPA and enjoin us." Pet. App. 188a.

analysis is far more deferential to government interests, which is surely why the United States argues it here for the first time. *See* R.S. Radford & Luke A. Wake, *Deciphering and Extrapolating: Searching for Sense in* Penn Central, 38 Ecology L.Q. 731, 735 & n.30 (2011); *see also* Pet. Br. at 42. Regardless of whether the *Penn Central* analysis is the best way to preserve and respect the rights guaranteed in the Takings Clause when the government regulates property from afar, this Court has squarely said, in no uncertain terms, that it does not apply to physical takings:

> This longstanding distinction between acquisitions of property for public use, on the one hand, and regulations prohibiting private uses, on the other, makes it inappropriate to treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a "regulatory taking," and vice versa. . . . [W]e do not ask whether a physical appropriation advances a substantial government interest or whether it deprives the owner of all economically valuable use.

Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 323 (2002); *see also Loretto*, 458 U.S. at 431-32 & n.10; *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (1978).

As described above (Pet. Reply Br. *supra* at 1, 8), the Commission seeks to apply the established physical takings analysis like the Court of Federal Claims did. To be clear, the Commission has never advocated for a regulatory takings analysis in this case. *See, e.g.*, Pet. 15-16; Pet. Br. 25-26, 33. Under the physical takings

analysis, where the character of the invasion amounts to a flood that results directly, naturally, or probably from a government action and substantially intrudes on a protected property interest, the Takings Clause guarantees just compensation. Pet. Br. at 21.

A. Flood invasions have always been recognized physical invasions that necessarily raise special concerns compared to regulatory interferences.

Flood invasions have always been considered physical invasions. The Court's entire body of takings law began with a flooding case in 1871. *See Pumpelly v. Green Bay Co.*, 80 U.S. 166 (1871); *see also Tahoe-Sierra*, 535 U.S. at 322 ("Our jurisprudence involving condemnations and physical takings is as old as the Republic .... Our regulatory takings jurisprudence, in contrast, is of more recent vintage."). Regulatory takings, which the United States' amici deride as nothing but a "judicial invention," were not recognized until 1920. *See* Int'l Mun. Lawyers Ass'n, et al. Amicus Br. at 21; *Penn. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922). While *Loretto* referenced a "complex balancing test" in the intermittent flooding cases, it decidedly was not *Penn Central* balancing because they were all decided decades before *Penn Central*. *See Loretto*, 458 U.S. at 428, 436 n.12; *Penn Central*, 438 U.S. 104.

The Court has long considered physical invasions to be intrusions of "unusually serious character" that "for the most part, involve[] the straightforward application of *per se* rules." *Loretto*, 458 U.S. at 427; *see also Tahoe-Sierra*, 535 U.S. at 322; *First English*

Evangelical Lutheran Church of Glendale v. County of Los Angeles, 482 U.S. 304, 329 (Stevens, J., dissenting). Physical invasions are much more likely to effect a taking because they necessarily injure two of the most fiercely guarded property rights: the rights to exclude and to use and enjoy property. *See Loretto*, 458 U.S. at 433, 439 n.17; *Causby*, 328 U.S. at 265; *Pumpelly*, 80 U.S. at 179 (citing a serious interruption to the use and enjoyment of property); *see also* Nat'l Fed'n of Indep. Bus. et al. Amicus Br. at 14-15.

Floods that are imposed by government action are actual physical invasions and have always been analyzed as such. *E.g.*, *Cress*, 243 U.S. at 328; *Pumpelly*, 80 U.S. at 179. The principles applied in those decisions informed the war-time cases that the United States argues (Resp. Br. at 32) are wholly inapplicable in this flooding context. *E.g.*, *United States v. General Motors*, 323 U.S. 373, 378 & n.5 (1945) (citing *Welch*, 217 U.S. 333); *see also Loretto*, 458 U.S. at 428 (explaining that in an earlier case the Court "applied the principles enunciated in *Pumpelly*" to find that placing telegraph poles constituted a taking even though they did not occupy the entire property).

Regulatory interferences, however, do not necessarily intrude upon those rights. Instead, they typically inflict only "economic" injuries. *E.g.*, *Tahoe-Sierra*, 535 U.S. at 322-23; *Penn Central*, 438 U.S. at 124. Or they may limit *future* uses of property as in *Penn Central* where the building owners could still continue using the property as they were before the city rejected their plans to add-on. *Id.* at 136. It is in *those* situations where this Court noted that it had "been unable to develop any 'set formula' for determining

when 'justice and fairness' require that *economic injuries* caused by public action be compensated . . . ." *Id.* at 124 (emphasis added). It would thus be a drastic change to apply *Penn Central* or any other body of regulatory takings law to flooding cases like the United States seeks. *Compare* Resp. Br. at 38 *with Tahoe-Sierra*, 535 U.S. at 323.

B. Applying a regulatory analysis to flood invasions that effect a physical taking would undermine the entire body of physical takings law.

To make a regulatory analysis seem appropriate here, the United States reinvents the undisturbed facts to make its flood invasions seem indirect and the Commission's injury seem small. But on the evidence introduced at trial, the Court of Federal Claims specifically found that the Corps' deviations increased flooding in the Management Area, the effect of deviations was predictable, the deviations "so profoundly disrupted certain regions of the Management Area that the Commission could no longer use those regions for their intended purposes (providing habitat for wildlife and timber for harvest)," and the increased flooding during the growing seasons "to an extent not experienced previously" resulted in increased mortality on the Management Area. Pet. App. 88a, 92a, 99a, 107a, 122a. At trial, the United States did not offer evidence of the general benefits of flood control to the public, or even to the Commission. Nor did it argue anything about Arkansas' law of water-use rights, or that downstream landowners are subject to a completely different body of takings law than upstream landowners.

The United States' rationales for changing the law here would unravel this Court's historic physical takings doctrine. First, no case has ever held that anything less than a permanent and complete physical occupation is subject to a *Penn Central* analysis like the United States argues. *See* Resp. Br. at 40. That rationale would overrule *Cress* where the flooding was intermittent. *See* 243 U.S. at 328. Instead, *Cress* applied the physical takings analysis to floods that were "inevitably recurring" and found that they constituted a taking. *Id.* at 327-28. Even "[i]f any substantial enjoyment of the land still remains," the Court would not consider anything about the public benefits of the government's actions like the United States argues is a relevant factor here. *Compare id. with* Resp. Br. at 44.

Second, the United States' rationale that floodwater is not "an occupation by the government," with only "the *possible* exception of backwater that can be regarded as part of the project," (Resp. Br. at 40) (emphasis added) would upend *Pumpelly*, 80 U.S at 179-80 (where permanent flooding by backwater was held to be an occupation), *Ridge Line, Inc.*, 346 F.3d at 1356 (where the Federal Circuit described a physical takings analysis for run-off caused by a government building upland from the plaintiff), and even *Causby*, 328 U.S. at 265-66 (where damages by noise and light from passing airplanes "were not merely consequential, but the product of a direct invasion"). Floodwater was, in fact, the very thing that started this Court's entire physical takings doctrine. *See Pumpelly*, 80 U.S. at 179 (warning against construing the Takings Clause so narrowly as to deny just compensation for flooding that

imposes "a serious interruption to the common and necessary use of property").

Third, the United States' rationale that something as "complex as downstream flooding" cannot constitute a physical invasion (Resp. Br. at 41) would encourage it to ignore the impacts of its own actions. The government is fully capable of assessing the downstream impacts of its flood control actions. *E.g.*, Pet. App. 99a ("In short, the effect of deviations in the Management Area was predictable, using readily available resources and hydrologic skills."). The United States itself admits that it buys flowage easements for "substantially downstream" operations. *See* Resp. Br. at 26. And it even argues not only that it *can* predict flooding impacts, but that it *will* by following NEPA when it changes its flood control policies. *See* Resp. Br. at 21-22. There is no reason to view downstream floods as legally incapable of being the direct result of a government action.

Fourth, the United States' rationale that its flood control actions do nothing but adjust the benefits and burdens of life in a floodplain (*see* Resp. Br. at 44) undermines the fundamental rights that the physical takings doctrine has protected since 1871. The rights to exclude others, especially the government, and to continue to use and enjoy property are fiercely guarded property rights and "cannot be so easily manipulated." *See Loretto*, 458 U.S. at 439 & n.17. Notably, the United States cites no authority where a landowner claiming a taking of property has had to prove that her burdens outweigh the "aggregate benefits" of a government action to the general public. *See* Resp. Br. at 44. *Miller v. Schoene* is no support for the United

States' position here because (a) no one disputes whether the United States *could* flood the Commission's property (the Commission argues only that, when it has done so, it must pay just compensation), and (b) the Commission's timber and habitat were not a threat to the public like the destroyed trees in *Miller*. *Cf.* 276 U.S. 272, 278, 280 (1928).

Weighing the benefits and burdens like the United States requests would be especially unfair. Accurately and fairly measuring the benefits of a regulatory action is often dubious at best. Framed like the United States wants, no landowner would ever have a right to compensation because it would have to prove that its burdens outweigh the abstract benefits of a regulation to the entire public. "The applicability of express constitutional guarantees is not a matter to be determined on the basis of policy judgments . . . . Nor can the vindication of those rights depend on the expense in doing so." *San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 661 (Brennan, J., et al., dissenting); *see also City of Van Buren v. United States*, 697 F.2d 1058, 1062 (Fed. Cir. 1983) ("[I]t is appropriate to emphasize here, where the government denies that any taking at all occurred, that only benefits inuring to the condemnee, rather than the community at large, are relevant . . . .").

The Takings Clause should not become such an "instrument of oppression rather than protection to individual rights." *Pumpelly*, 80 U.S. at 179. Rather than backslide from the historic protections outlined in its physical takings decisions, the Court should confirm them.

CONCLUSION

The Court should reverse and remand with instructions for the Federal Circuit to apply the correct physical takings analysis.

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September 19, 2012

AMICUS CURIAE BRIEF

No. 11-597

In The
Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,

Petitioner,

v.

UNITED STATES OF AMERICA,

Respondent.

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

BRIEF OF INTERNATIONAL MUNICIPAL LAWYERS ASSOCIATION, INTERNATIONAL CITY/COUNTY MANAGEMENT ASSOCIATION, NATIONAL ASSOCIATION OF COUNTIES, NATIONAL LEAGUE OF CITIES, AND U.S. CONFERENCE OF MAYORS AS *AMICI CURIAE* IN SUPPORT OF RESPONDENT

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International Municipal Lawyers Association, International City/County Management Association, National Association of Counties, National League of Cities, and U.S. Conference of Mayors respectfully submit this brief *amicus curiae* in support of Respondent.[1]

INTERESTS OF *AMICI CURIAE*

The International Municipal Lawyers Association, an advocate and resource for local government lawyers since 1935, serves as an international clearinghouse for legal information and cooperation on municipal legal matters for its 3000 members. The International City/County Management Association is a nonprofit professional and educational organization of over 9000 appointed chief executives and assistants serving cities, counties, towns, and regional entities; its mission is to create excellence in local government by advocating and developing the professional management of local governments throughout the world. The National Association of Counties, the only national organization that represents county governments in the United States, provides essential services to the nation's 3068 counties through advocacy, education and research. The National League of Cities, the country's largest and oldest organization serving municipal

[1] Pursuant to Supreme Court Rule 37.6, *amici curiae* state that no counsel for any party authored this brief in whole or in part, nor did any person or entity, other than *amici curiae*, make a monetary contribution to the preparation or submission of this brief. This brief is filed with the written consent of all the parties.

government, represents more than 19,000 U.S. cities and towns; its mission is to strengthen and promote cities as centers of opportunity, leadership, and governance. The U.S. Conference of Mayors, founded in 1932, is the official nonpartisan organization of all U.S. cities with populations of more than 30,000.

Amici curiae have a particular interest in this case because the Petitioner and its *amici curiae* ask the Court to jettison longstanding limits on the scope of physical takings doctrine and thereby expand the scope of the Takings Clause, which would subject local governments to major new financial burdens and impede their ability to perform essential public functions.

This proposed expansion of local government liability under the Takings Clause comes at a particularly inopportune time. In the aftermath of the Great Recession, "increasing numbers of local governments are encountering fiscal stress," both because of their own fiscal problems and because the States are passing the consequences of their fiscal problems down to the local level. Richard Ravitch & Paul A. Volcker, Report of the State Budget Crisis Task Force, Summary Report 18 (July 2012), available at http://www.statebudgetcrisis.org. As a result of these fiscal problems, local governments have laid off hundreds of thousands of workers over the last several years, undermining local governments' abilities to serve their citizens' needs and impeding a national economic recovery. *See* Sheila Dewain & Motoko Rich, *Public Workers Face Rash of Layoffs, Hurting Recovery*, N.Y. Times 1 (June 19, 2012).

INTRODUCTION AND SUMMARY OF ARGUMENT

While this case raises some general questions about takings law, it involves an unusual set of circumstances presenting these questions in an unusual light.

This case is a rare but not unprecedented example of one government suing another government under the Takings Clause. But Petitioner's governmental character is beside the point for the purpose of resolving the issues in the case. Petitioner claims a taking based on alleged incremental inundation of a floodplain and seeks compensation for damage to commercial timber. Thus, the case would be exactly the same if this lawsuit had been brought by, for example, a private timber investment firm.[2]

Second the case involves a claim against the United States whereas, for the reasons to be discussed, this type of claim is more likely to arise from state and local government action. The federal government's liabilities under the Takings Clause, to the extent the U.S. has waived its sovereign immunity, are paid from the permanent, unlimited Judgment

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[2] Petitioner describes at length the environmental values protected by the Black River Wildlife Management Area, but this claim does not arise from or relate to any injury to those values. Therefore, they are irrelevant to the resolution of this case.

Fund. *See* 31 U.S.C. § 1304. By contrast, local governments are directly liable for their takings liabilities and can only secure and afford limited insurance against such liabilities. Thus, a ruling in favor of Petitioner in this case would actually be far more disruptive of the operations of state and local governments than those of the United States.

Finally, it is noteworthy that the lower courts ignored a threshold issue in this case – the nature and scope of the asserted property interest allegedly taken. Petitioner has prosecuted its case, including in this Court, on the assumption that it has a vested entitlement to a specific flow regime in the Black River passing by its property. This is plainly a mistaken premise as a matter of federal law because the operating manual for the Clearwater Dam contemplates that the operation of the dam will include deviations in the flow regime below the dam. It is also mistaken as a matter of state law, because neither the law of Arkansas nor of any other state gives a riparian land owner the right to insist that those upstream never take any action that will increase or decrease the volume of water flowing downstream at any particular point in time. Indeed, the law is exactly the opposite, that those owning land along a river must anticipate that they will have to share the benefits and burdens of riparian ownership with their neighbors. *See Harris v. Brooks*, 283 S.W.2d 129 (Ark. 1955). The nature of the underlying state property interest in this case appears to preclude Petitioner

from claiming an interference with a vested entitlement under any takings theory. At a minimum, the nature of the underlying state property interest may be relevant to the issue of whether there has been an interference with distinct investment-backed expectations sufficient to support a valid takings claim.

As to the merits of the decision by the U.S. Court of Appeals for the Federal Circuit, the Court should affirm the decision below. The Court has long held that a physical invasion or occupation constitutes a compensable taking only if it involves a permanent – or inevitably recurring – invasion or occupation. While the Court has suggested in *dictum* (outside of the flooding context) that a temporary occupation or invasion can constitute a taking under some circumstances, the Court should disavow this ill-considered *dictum* and affirm the longstanding permanency requirement. The permanency requirement comports with the language and original understanding of the Takings Clause and provides clear guidance to property owners, government officials and the general public. Moreover, preserving this requirement upholds the salutary doctrine of *stare decisis*. Alternatively, if the Court decides to jettison the longstanding permanency requirement, *amici curiae* urge the Court to rule that a temporary physical takings claim should be evaluated using the traditional *Penn Central* multi-factor analysis. The Court should certainly reject the radical proposal advanced by some of Petitioner's *amici curiae* that all physical occupations

and invasions, no matter how modest or temporary, should be subject to a single, sweeping *per se* rule.[3]

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[3] There is also a substantial threshold question whether this claim is barred by the doctrine of sovereign immunity by virtue of 33 U.S.C. § 702c, which states: "No liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood water at any place." As the Court said in *United States v. James*, 478 U.S. 597 (1986), this provision "outlines immunity in sweeping terms;" indeed, "it is difficult to imagine broader language." *Id.* at 604. This case plainly appears to involve a claim of "damage" arising "from or by floods or flood water" within the terms of the statute. *See* Pet. Br. at 43 (describing this lawsuit as seeking recovery for "massive and foreseeable damage" to private property). Moreover, "[a]ny ambiguities in the statutory language are to be construed in favor of immunity, so that the Government's consent to be sued is never enlarged beyond what a fair reading of the text requires." *FAA v. Cooper*, 132 S. Ct. 1441, 1448 (2012). Given the existence of the Tucker Act, sovereign immunity is rarely a disputed issue in modern takings cases. But a waiver of the government's immunity is clearly necessary to subject the United States to financial liability under the Takings Clause. *See Lynch v. United States*, 292 U.S. 571, 579 (1934); *Schillinger v. United States*, 155 U.S. 163, 168 (1894). *See also United States v. Mitchell*, 463 U.S. 206, 217 (1983) (explaining that the issue of whether a party can assert a substantive claim to financial compensation is analytically distinct from the issue of whether the United States has consented to be sued). *Cf. Webster v. Doe*, 486 U.S. 592, 613 (1998) (Scalia, J., dissenting) ("No one would suggest that, if Congress had not passed the Tucker Act, 28 U.S.C. § 1491(a)(1), the courts would be able to order disbursements from the treasury to pay for property taken under the lawful authority (and subsequently destroyed) without just compensation."). The conclusion that sovereign immunity bars this suit seeking financial compensation would not, of course, bar a claimant from seeking a declaratory judgment and a "corresponding injunction." *Eastern Enterprises, Inc. v. Apfel*, 524 U.S. 498, 520 (1998)

(Continued on following page)

ARGUMENT

I. The Court's Resolution of this Unusual Case Involving the United States Could Have Significant Implications for Local Governments and Their Ability to Perform Some of Their Traditional Functions.

The facts of this relatively unique case have the potential to obscure the particular threats to local governments posed by the arguments of Petitioner and its *amici curiae* for extending physical takings doctrine to temporary occupations or invasions. In a variety of contexts, for a variety of important public purposes, government officials intentionally or inadvertently cause temporary or occasional physical invasions of private property. Exposing local taxpayers to potential financial liability under the Takings Clause for all such incidental injuries to property would impose significant new financial burdens on already straitened local governments as well as impede important government functions. In other words, in the context of temporary invasions or occupations, as much as with regulatory restrictions, "government hardly could go on" if it could be held liable under the Takings Clause every time it acted. *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 413 (1922).

(plurality). *See United States v. Lee*, 106 U.S. 196, 222-23 (1882) (recognizing the availability of a suit for injunctive relief against federal officials for an uncompensated taking prior to adoption of the Tucker Act).

Of most immediate concern, Petitioner's proposed takings theory would seriously undermine the ability of local governments to address a host of local water management issues. Managing the flow of storm water, sewage and other forms of water is one of the most important and difficult functions of local government. *See generally* Ass'n of State Flood Plain Managers, *Floodplain Management 2050* (2007), available at http://www.floods.org; The President's Federal Interagency Floodplain Management Task Force, *Sharing the Challenge: Floodplain Management Into the 21st Century* (1994), available at http://www.gpo.gov.

Accordingly, there are numerous state court decisions, arising in a host of different factual circumstances, addressing whether local water management decisions can give rise to takings liability. Given the inherent variability of water flows, the imperative for local government to construct and maintain significant water infrastructure, and the occasional need for government to choose (sometimes quickly) between two inevitable harms, many state courts have been reluctant to hold the public liable for a taking based on temporary, occasional, or incidental injuries to property attributable to governmental water management actions. *See, e.g., Allianz Global Risks U.S. Ins. Co. v. State*, 13 A.3d 256, 260 (N.H. 2010) (affirming rejection of takings claim based on property damage caused by state construction and widening of highway when plaintiff "produced no evidence that the circumstances which caused the flood damage are inevitably recurring");

Ondovchik Family Partnership Ltd. v. Agency of Transp., 996 A.2d 1170, 1186 (Vt. 2010) (rejecting takings claim based on damage to plaintiff's roadside property as a result of agency's snow removal activity, on the ground that this activity had merely resulted in "intermittent snow throw and water runoff"); *Edwards v. Hallsdale-Powell Utility Dist. Knox County*, 115 S.W.3d 461 (Tn. 2003) (rejecting takings claim based on flooding of plaintiff's home with sewage on two occasions on the ground that government had not taken a sufficiently "purposeful or intentional" action to support a viable takings claim). *But see Livingston v. Virginia Dept. of Transp.*, 726 S.E.2d 264 (Va. 2012) (rejecting, over strong dissent, lower court's conclusion that property owners could not proceed with a takings claim based on property damage associated with a single flooding event). The *amici curiae* believe the majority rule in this arena is legally supported and generates sound, practical outcomes. We urge the Court to avoid an interpretation of the Takings Clause that would impose unreasonable new burdens on local governments charged with addressing flooding threats and other serious water management challenges.

The Petitioner's expansive theory of physical takings liability could also impede other important local government functions. For example, State and local officials routinely conduct inspections of private property to help safeguard public health and safety. To date, takings claims based on such inspections have routinely been rejected, and the Court should take care in this case to avoid disturbing this long

settled precedent. Long ago, this Court rejected a claim that government inspections of private property without owner consent could give rise to takings liability. *See Montana Co. v. St. Louis Mining & Milling Co.*, 152 U.S. 160 (1894) (state statute authorizing physical inspections of private mine property not a taking). Subsequently, state courts have likewise rejected claims that government inspections of private property can give rise to takings liability. *See* Sandra Bullington, Entry Onto Private Property in 9 Nichols on Eminent Domain, Ch. 9-32, § G32.06, n. 8 (3rd ed. 2007) ("The overwhelming majority of cases have held that the entry onto private property for the purpose of conducting examinations and surveys does not constitute a taking."), citing *e.g., State by Waste Management Board v. Bruesehoff*, 343 N.W.2d 292, 295 (Minn. 1984); *Southern California Gas Co. v. Joseph W. Wolfskill Company*, 28 Cal. Rptr. 345, 349-350 (1963).

Numerous state statutes, designed to achieve a range of public goals, authorize public inspections of private property by government officials. *See, e.g.*, Ark. Code Ann. § 26-58-120 (2005) (authorizing inspection of timber processing facilities to ensure compliance with severance tax requirements); Wis. Stat. § 88.13 (2012) (authorizing entry by officials or agents upon "any land" for "any purpose" connected with repair or maintenance within drainage district or adjoining lands); Cal. Food & Agric. Code § 42821 (1967) (authorizing inspection of facilities engaged in the production or distribution of fruits and nuts);

Minn. Stat. § 18D.201 (2011) (authorizing inspections of agricultural chemical facilities); Mont. Code Ann. § 87-3-225 (1989) (authorizing inspection of fish hatcheries and culture facilities). A ruling by this Court authorizing the routine prosecution of takings claims based on government inspections of private premises would seriously undermine important, well-established government functions and responsibilities.

Amici curiae recognize that government inspections of private property raise legitimate concerns about whether officials are acting reasonably in conducting the inspections and/or whether owners' expectation of privacy are being unduly impaired. Traditionally, such issues have been addressed under the Fourth Amendment, largely in terms of whether a warrant is or is not required to conduct the inspection. *Compare Camara v. Municipal Court*, 387 U.S. 523, 530 (1967) (warrantless property inspection violates Fourth Amendment) *with Donovan v. Dewey*, 452 U.S. 594 (1981) (warrantless property inspection does not violate Fourth Amendment). Landowners would receive little additional protection for their legitimate privacy interests by transforming objections to property inspections into Fifth Amendment takings claims. On the other hand, this step would cause considerable mischief for state and local governments, especially if claims for compensation could be asserted regardless of whether a warrant had been obtained in advance of the inspection.

II. A Permanent or Inevitably Recurring Invasion or Occupation is Required to Hold the Government Liable for a Physical Taking.

The Court should affirm the ruling below. The U.S. Court of Appeals for the Federal Circuit properly rejected this takings claim based on this Court's longstanding rule that a permanent (or at least inevitably recurring) occupation or invasion of private property is required to support a property owner's claim that her property has been physically "taken" by the government under the Fifth Amendment.

Amici curiae recognize that *dictum* in some Court decisions suggests that temporary invasions or occupations can constitute takings, with the merits of such claims being subject to analysis using the *Penn Central* multi-factor framework. *See Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 428 n. 9 (1982); *Lingle v. Chevron USA, Inc.*, 544 U.S. 528, 539 (2005). However, neither the Court's actual prior holdings nor sound reasoning supports applying the Takings Clause to merely temporary occupations or invasions.

In a long series of decisions stretching back to the late 19th century the Court has addressed whether and under what circumstances government-caused flooding will support a takings claim. The rule emerging from these cases is that permanent flooding – and only permanent flooding – will support a takings claim. For the purpose of this longstanding rule,

"permanent" encompasses not only the permanent overflow of land, such as by water in a pool created behind a dam, but also a permanent condition exposing the owner to constantly recurring flooding. *See, e.g., United States v. Cress*, 243 U.S. 316, 328 (1926) (upholding a finding of a taking when erection of a lock and dam created a "permanent condition by which the land is subject to frequent overflows"). Summing up this body of precedent, the Court declared in *Sanguinetti v. United States*, 264 U.S. 146, 149 (1924): "[I]n order to create an enforceable liability against the government" under the Takings Clause, an overflow with water must "constitute an actual permanent invasion of the land, amounting to an appropriation of and not merely an injury to the property." *See also Transportation Co. v. Chicago*, 99 U.S. 635, 642 (1878) (a "permanent flooding of private property," involving "a physical invasion of the real estate of the private owner, and a practical ouster of his possession," can constitute a "taking"); *Pumpelly v. Green Bay & Mississippi Canal Co.*, 80 U.S. 166, 177 (1871) (a taking occurred when "the overflow [caused by a dam] remained continuously [on Petitioner's private property] from the completion of the dam").

At the same time, the Court has recognized that "mere temporary invasions" do not constitute takings. *Loretto,* 458 U.S. at 428. *See also Sanguinetti,* 264 U.S. at 149 (ruling that the "condition" for a taking that there be "an actual, permanent invasion of the land" was "not met in this case"); *Bedford v. United*

States, 192 U.S. 217, 224-25 (1904) (riprap designed to maintain river channel that caused incidental flooding and erosion not a taking).

There are sound justifications for the requirement of permanency to establish a physical taking. First, this limitation on the scope of government liability is faithful to the language and original understanding of the Takings Clause. As the Court has repeatedly explained, until the beginning of the 20th century, "it was generally thought that the Takings Clause reached only a 'direct appropriation' of property," that is, a complete seizure of the property, or the functional equivalent of a 'practical ouster of [the owner's] possession.'" *Lingle*, 544 U.S. at 537, quoting *Lucas v. S. Carolina Coastal Council*, 505 U.S. 1003 1014 (1992), quoting *Transportation Co. v. Chicago*, 99 U.S. 642 (1879). This type of case obviously does not involve an actual seizure of private property. And, as a matter of common sense as well as precedent, only a "permanent" physical occupation can be equated with a "practical ouster of the owner's possession." *Id.* A merely temporary invasion may cause incidental injury, and may give rise to liability in tort or on some other theory, but it does not oust an owner of possession and lead to a taking.

Second, the permanency requirement has the virtue of creating a relatively bright line between the circumstances in which owners will be compensated and those in which the public will be protected from liability under the Takings Clause, creating certainty for property owners and government officials alike.

Governments at all levels of the federal system have major responsibilities for managing water flows, in particular for the purpose of promoting navigation, flood protection and storm water management. A rule that subjected government to the threat of takings liability for any injury to private property interests due to flooding, no matter how minor or infrequent, would impose a major financial burden on government, especially at the local level, both in terms of litigation costs and potential judgments. *Cf. Eastern Enterprises*, 524 U.S. at 542 (Kennedy, J., concurring in part and dissenting in part) (observing that another proposed expansion of takings doctrine would "subject[ ] states and municipalities to the potential of new and unforeseen claims in vast amounts").

Third, the principle of *stare decisis* strongly supports retention of the permanency requirement. The requirement of permanency pervades not only the Court's early cases but is central to the holdings in the Court's modern cases applying the physical takings rule. *See Dolan v. City of Tigard*, 512 U.S. 374, 384 (1994) (describing the imposition of an easement of indefinite duration as a taking); *Nollan v. California Coastal Commission*, 483 U.S. 825, 831-32 (1987) (describing the creation of a "permanent and continuous right to pass to and fro" over someone's real property as a taking); *Loretto*, *supra*. Moreover, as the Court has observed, "[c]onsiderations in favor of *stare decisis* are at their acme in cases involving property and contract rights, where reliance interests

are involved." *Payne v. Tennessee*, 501 U.S. 808, 827 (1991).

Finally, it is highly instructive that in states where the state takings clauses, like the federal Takings Clause, only protect against "takings," the state courts consistently insist that an invasion or occupation must be permanent to support a viable takings claim. *See, e.g., Marty v. State,* 838 P.2d 1384, 1388 (Idaho 1992) (affirming dismissal of takings claim under Idaho Constitution because inundation was neither permanent nor inevitably recurring); *Kingsway Cathedral v. Iowa Dept. of Transp.*, 711 N.W.2d 6, 8-12 (Iowa 2006) (rejecting takings claim under the Iowa (and federal) Takings Clauses because activity allegedly causing property damage was only temporary in nature). By contrast, in states where the takings clauses authorize recoveries for "takings" and "*damaging*," the courts more frequently permit recoveries for temporary invasions or occupations. *See, e.g., Livingston v. Virginia Dept. of Transp.*, 726 S.E.2d 264, 271 (Va. 2012) (holding, over a strong dissent, that a single instance of flooding can establish a taking under Virginia's Constitution); *Bogue v. Clay County,* 60 N.W. 218, 224 (S.D. 1953) (affirming lower court finding of a taking under the South Dakota Constitution for "temporary taking" due to inundation). Viewing this case through the lens offered by these state court decisions, Petitioner's argument to expand federal takings doctrine to include temporary invasions or occupations amounts to a petition to rewrite the federal Takings Clause as follows: "Nor

shall private property be taken *or damaged* for public use, without just compensation." The Court should reject this petition because (1) the Court obviously has no authority to insert new language in the constitutional text, and (2) taking this step would effectively obliterate the distinctions embedded in state takings jurisprudence based on the individual states' careful choices to include – or omit – the word "damage" in their takings clauses.[4]

Amici curiae recognize that the Court's *Loretto* decision suggests in *dictum* that a temporary occupation or invasion can result in a taking. But, upon examination, that decision provides no genuine support for this suggestion, and in fact the decision supports the rule that only a permanent physical occupation or invasion can constitute a taking. The decision refers to several cases ostensibly illustrating that "temporary" invasions can constitute takings – including *Pruneyard Shopping Center v. Robbins,* 447 U.S. 74 (1980), *Kaiser Aetna v. United States*, 444 U.S. 164 (1979), and what the Court refers to as "the intermittent flooding cases." *See* 458 U.S. at 435 n. 12. But all of these cases actually involved a permanent invasion

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[4] It is instructive that *amicus* National Association of Homebuilders, in its brief in support of the petition for *certiorari,* referred to *Fitzpatrick v. Okanagon County*, 238 P.2d 1129 (Wash. 2010), as an example of a case "acknowledge[ing] that just compensation is required in the context of temporary flooding cases" (Br. at 11) – but failed to recognize or acknowledge that the Washington State Takings Clause addresses takings *and damaging*.

or occupation as the Court has defined that concept, that is, (1) an actual permanent intrusion or (2) creation of a permanent condition subjecting an owner to indefinitely recurring intrusions.

In particular, *Pruneyard* involved a takings claim based on enforcement of a state constitutional provision the California Supreme Court had interpreted to require owners of private shopping malls to open their properties to political leafleteers. This government intrusion represented the kind of indefinite invasion that the Court has characterized as a "permanent physical occupation." *See Nollan,* 483 U.S. at 832 (a "permanent physical occupation" occurs when "individuals are given a permanent and continuous right to pass to and fro, so that the real property may continuously be traversed, even though no particular individual is permitted to station himself permanently upon the premises"). *Kaiser Aetna* involved a federal mandate requiring a property owner to allow indefinite public access to a previously "private pond," and therefore plainly involved a permanent physical taking. Finally, the "intermittent flooding" cases, even if they did not involve literally permanent occupations, certainly involved "permanent condition[s] . . . by which the land [was] subject to frequent overflows," *Cress*, at 328. Therefore, they also fall within the scope of the Court's established rule governing permanent physical occupations or invasions. In sum, all of the cases the *Loretto* Court referred to in *dictum* as supposedly supporting the idea that a temporary

physical invasion or occupation can constitute a taking do not, in fact, support that proposition.[5]

The conclusion that merely temporary invasions or occupations do not constitute takings is consistent with the Court's decisions holding, in a different context, that direct "appropriations" generally do constitute takings regardless of the duration of the appropriation. *See, e.g., Kimball Laundry v. United States,* 338 U.S. 1 (1949); *United States v. General Motors*, 323 U.S. 373 (1945); *United States v. Petty Motor Co.,* 327 U.S. 372 (1946). While a physical invasion or occupation, on the one hand, and an appropriation, on the other hand, are sometimes lumped together for the purpose of discussion, these two types of intrusions are actually distinguishable from each other for the purpose of takings analysis, as the Court itself has recognized: "The paradigmatic taking . . . is a direct appropriation *or* physical invasion of private property." *Lingle*, 544 U.S. at 537 (emphasis added). A direct appropriation involves a complete seizure of

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[5] The decision that perhaps comes closest to supporting the idea that a temporary invasion or occupation might constitute a taking is *United States v. Causby*, 328 U.S. 256 (1946), in which the Court ruled that government planes continuously passing very low over plaintiffs' property during takeoffs and landings, and causing very considerable economic loss in the process, constituted a taking. This case can be distinguished from the ordinary temporary invasion or occupation because, at the time of the alleged taking, the government projected continuing the overflights for up to 25 years. *Id.* at 258. Understandably, the Court has subsequently described *Causby* as an example of a permanent (indefinite) physical occupation. *See Lucas,* 505 U.S. at 1015.

ownership and possession of private property by the government, typically accomplished through a formal exercise of the eminent domain power. None of the so-called World War II seizure cases cited above expressly addressed the question of whether a taking had occurred. But the Court assumed – correctly, in our view – that the direct appropriation of private property, even for a limited term, is a taking. *See also United States v. Pewee Coal Co.*, 341 U.S. 114 (1951) (finding a taking when the President issued an Executive Order directing the Secretary of the Interior to take possession of and operate private coal mines for a limited period on behalf of the public); *Tahoe-Sierra Preservation Council v. Tahoe Regional Planning Agency*, 535 U.S. 302, 324 n. 19 (2002) ("Condemnation of a leasehold gives the government possession of the property, the right to admit and exclude others, and the right to use it for a public purpose.").

By contrast, mere physical invasions or occupations, though they surely divest owners of a "fundamental" property interest, that is, the right to exclude others from the property, *see Kaiser Aetna*, 444 U.S. at 179, do not generally divest the owner of every attribute of property ownership. In the case of Ms. Loretto, for example, the cable company's installation of the cable box on her building did not deprive her of the ability to rent her apartments, earn income from her building, and generally treat the building as her property.

The conclusion that merely temporary invasions or occupations do not constitute takings is also consistent with the Court's recognition that temporary regulatory restrictions on property use may, in some rare circumstances, constitute takings under *Penn Central*. *See Tahoe-Sierra*. This differential treatment is explained and justified by the distinction between "classic takings," *Lingle*, 544 U.S. at 539, including direct appropriations and ousters due to permanent physical invasions or occupations, and regulatory takings. Classic takings are government intrusions that self-evidently constitute takings. By contrast, regulatory takings doctrine, which is essentially a judicial invention, *see Lingle*, 544 U.S. at 537, depends on identifying government actions that do not fit the definition of a classic taking but nonetheless should be deemed takings because they are "functionally equivalent" to classic takings in terms of their effects on property owners. *Id.* In other words, the former type of takings claim involves application of clear rules whereas the latter type proceeds by a process of reasoning by analogy. As the Court explained in *Tahoe-Sierra*:

> our jurisprudence involving condemnations and physical takings is as old as the Republic and, for the most part, involves the straightforward applications of *per se* rules. Our regulatory takings jurisprudence, in contrast, is of more recent vintage and is characterized by "essentially ad hoc, factual inquiries."

Id. at 322, quoting *Penn Central Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978). Given the

generally *ad hoc* nature of the search for functional equivalence in regulatory takings cases, the Court has understandably left open the possibility that certain temporary restrictions can be so burdensome that they may qualify as the functional equivalent of "true" takings. By contrast, in the case of physical takings, where the application of the Takings Clause is direct and straightforward, there is no warrant for ambiguity or interpretation: a permanent (or inevitably recurring) physical invasion or occupation is a taking; a merely temporary invasion or occupation is not.

The upshot of the various distinctions previously drawn by the Court between different types of takings claims can be summarized as followed in terms of (1) whether and how the so-called parcel as a whole rule applies to each type of claim, and (2) whether a particular claim is governed by a *per se* takings rule or the *ad hoc Penn Central* analysis. The two issues are closely related, in the sense that the more intrusive the government action the more the Court's decisions tend to deploy the Takings Clause as a protection against uncompensated intrusions, *either* by defining the relevant parcel more narrowly or by applying a relatively strict takings test. But, in doctrinal terms, the issues are quite different: the parcel issue addresses the question of how to define the unit of "property" affected by government action; the applicability *vel non* of a *per se* takings test goes to the issue of whether the government action constitutes a "taking."

The parcel as a whole rule does not come into play in the case of direct appropriations, in either the geographic or the temporal dimension. In other words, in defining the unit of property, the Court has deemed it irrelevant whether the appropriated area of property is part of a larger parcel or whether the appropriation lasts permanently (or at least indefinitely) or for a limited term. *See, e.g., Kimball Laundry, supra*. Also in the case of a physical invasion or occupation, the parcel rule does not apply in the geographic dimension, meaning that the relevant unit of property is the specific area affected by the intrusion, whether or not such area is all of the claimant's property or part of a larger parcel. On the other hand, the Court has made clear that the parcel rule does apply in the temporal dimension, making the duration of the invasion highly relevant if not decisive for the disposition of this type of claim. *See Loretto, supra* (using the term "permanent" 25 times to underscore the point that the takings test articulated in this case is limited to permanent occupations or invasions). Finally, in the case of an alleged regulatory taking, the parcel as a whole rule applies in *both* the geographic and the temporal dimensions, meaning that the effect of a restriction on the use of a portion of property must be assessed in the context of the larger parcel of which the restricted portion is a part and, likewise, in relation to the entire life of the property. *See Tahoe-Sierra, supra*.

The Court's decision in *Tahoe-Sierra* reflects a clear recognition of the importance of these distinctions.

"When the government physically takes possession of an interest in property for some public purpose," the Court said, "compensation is mandated . . . even though that use is temporary." 535 U.S. at 322. By contrast, the Court said, when the government effects a taking under the *Loretto* rule, "it is required to pay for [the property occupied] no matter how small" the area affected. *Id.* In this latter context, consistent with the Court's longstanding articulation of its rule for permanent physical occupations, the Court did *not* say that the rule applies to purely temporary intrusions. Finally, the actual holding in *Tahoe-Sierra* reflects, of course, the conclusion that, in the regulatory takings context, the parcel as a whole rule applies in *both* the geographic and temporal dimensions.

As discussed, the question of whether a claim is governed by a *per se* takings test is distinct from the question of how to define the relevant parcel. As the Court recently explained, the "polestar" of the Court's takings jurisprudence is the guidelines provided in *Penn Central*. *Tahoe-Sierra*, 535 U.S. at 326 n. 23. Under *Penn Central*, courts evaluate a takings claim by considering (1) the economic impact of the government action, (2) the degree of interference with investment-backed expectations, and (3) the character of the government action. *Lingle*, 544 U.S. at 538-39. In addition to this general, default standard, the Court has established a relatively narrow set of *per se* or categorical tests, such as for permanent physical occupations, *see Loretto,* or regulatory restrictions

that render the property valueless. *See Lucas*. *See also Lingle*, 544 U.S. at 539 (describing the *Nollan* and *Dolan* tests governing "exactions"). The Court's cases addressing direct appropriations also implicitly apply what amounts to a *per se* takings test; or perhaps it would be more accurate to say that the Court has simply treated "an actual taking of possession and control" as a self-evident taking. *Pewee Coal Co.*, 341 U.S. at 116.

In essence, using a *per se* takings test means that a court often evaluates the claim based on a single *Penn Central* factor alone, ignoring the other factors. For example, in the case of a physical taking claim based on a permanent invasion or occupation, the Court has said that the character factor resolves the claim and the case must be evaluated without regard to the remaining two *Penn Central* factors, that is, the economic impact of the action or the degree of interference with investment-backed expectations. *See Loretto*, 458 U.S. at 434-35 ("[W]hen the 'character of the governmental action' . . . is a permanent physical occupation of property, our cases uniformly have found a taking to the extent of the occupation, without regard to whether the action achieves an important public benefit or has only minimal economic impact on the owner"). Similarly, in the case of the *per se Lucas* test, the Court has said that when the economic impact rises to the level of a total denial of all economic use, the taking claim must be evaluated based on the economic impact factor alone, without regard to the other *Penn Central* factors, that is,

investment-backed expectations and the character or purpose of the regulations. *See Lucas*, 505 U.S. at 1017-18 & n. 8.

Combining the Court's relevant parcel rules and its different takings tests, the Court's takings jurisprudence has generated the following general guidelines: (1) a direct appropriation of any portion of a property for any period of time will generally constitute an automatic or *per se* taking; (2) a permanent physical invasion or occupation of private property will also generally result in a *per se* taking; and (3) a regulatory prohibition on use destroying the value of an entire property on a permanent or indefinite basis will generally constitute a *per se* taking under the *Lucas* rule. On the other hand, if a regulatory restriction applies to less than all of the property in a geographic sense, the restriction allows the owner to continue to make some economic use of the property, and/or the restriction is imposed only on a temporary basis, the regulatory restriction will amount, at most, to a potential *Penn Central* claim.[6]

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[6] To be sure, the Court's decisions arguably leave some questions unresolved. For example, the Court's *Lucas* total takings test apparently applies exclusively to regulations affecting fee simple interests in land, *see Tahoe-Sierra*, 535 U.S. at 330 (describing the *Lucas* rule as applying to the "permanent 'obliteration of the value' of a fee simple estate"), but some lower courts have ruled that the test applies to far more limited interests in property. *See, e.g., Cane Tennessee, Inc. v. United States*, 60 Fed.Cl. 694 (2004) (applying *Lucas* to a royalty interest in a mineral estate). In addition, a literal application of the *Lucas per se* rule might suggest that a claimant's advance

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This framework developed by the Court offers a clear set of rules for applying the Takings Clause in different ways to different types of government actions that implicate the core concerns underlying the Takings Clause in different ways. Direct government appropriations, physical invasions or occupations, and restrictions on the use of property can be identified and distinguished from each other by the courts and litigants with relative ease. In addition, each of these types of government action involves different degrees of intrusion into private property interests, justifying different levels of scrutiny under the Takings Clause. As discussed, a direct appropriation unquestionably represents the most severe form of government interference with private property rights because it affects the full range of an owner's interests in property. A physical invasion or occupation intrudes upon the "treasured" right to exclude, *see Loretto*, 458 U.S. at 435, and therefore is more serious in nature than a mere restriction on property use, but represents a less serious intrusion than a direct appropriation because it impairs only one (albeit an important) strand in the bundle of property rights.

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notice of regulatory constraints should always be irrelevant in a *Lucas*-type case. But that approach would allow a developer who was granted permission to develop the larger part of a property to later convey out a small undeveloped part of the property to a new owner for the express purpose of manufacturing a *Lucas* claim, effectively eviscerating the parcel as a whole rule in the regulatory takings context. The Court need not worry about these loose threads in applying its well-developed analytic framework to this takings case.

Finally, regulatory restrictions on property use call for the least demanding level of scrutiny under the Takings Clause because they typically affect the right-to-use strand in the bundle of property sticks in a fashion that produces a "reciprocity of advantage" for all affected property owners. *See Lucas*, 505 U.S. at 1017 (referring to the Court's "usual assumption," except in the "extraordinary circumstance when *no* productive or economically beneficial use of land is permitted," that "the legislature is simply adjusting the benefits and burdens of economic life . . . in a manner that secures an average reciprocity of advantage to everyone concerned") (emphasis in original; internal citations and quotations omitted). This framework, developed in painstaking fashion by the Court over many decades, achieves a proper balance between articulating predictable rules, for the benefit of property owners, government officials and the public as a whole, and formulating legal doctrine that is responsive to the different levels of concern for private property protection raised by different types of government actions.

The conclusion that permanent government occupations or invasions invariably result in takings fits logically into the framework described above. The permanency requirement for physical takings claims differentiates highly intrusive direct appropriations from still serious but less intrusive occupations or invasions. On the other hand, the Court's strict takings rule applicable to physical invasions or occupations means that such claims will generally be upheld

no matter how modest the economic impact or the degree of interference with investment-backed expectations. As a result, in this important respect, the Court's takings jurisprudence provides greater protection from government physical intrusions than from regulatory restrictions on use.

Finally, it is noteworthy that the longstanding permanency requirement for physical takings claims based on occupations or invasions does not preclude property owners from potentially recovering for temporary intrusions on some alternate theory – under tort law, for example. The Court has repeatedly recognized that even if a flooding does not have the element of permanence required to support a taking claim, recovery under a tort theory might be available. *See, e.g., Sanguinetti*, 264 U.S. at 150; *see also Keokuk & Hamilton Bridge Co. v. United States*, 260 U.S. 125 (1922). Under the Federal Tort Claims Act, the United States has waived sovereign immunity in various kinds of tort actions, including certain tort claims arising from water management actions. *See In re Katrina Canal Breaches Litigation*, 673 F.3d 381 (5th Cir. 2012) (upholding ruling that United States was liable in tort for property damages caused by faulty U.S. Army Corps of Engineers' technical calculations leading to delay in armoring banks of navigation channel). To be sure, 33 U.S.C. § 702c, discussed above, *see* note 3, *supra*, preserves government immunity from liability in tort (as well as takings) for damage due to the operations of flood-control projects. But that policy is subject to legislative revision or modification. The fact that the extent of

public liability in tort for damages attributable to flood control projects is subject to congressional control does not ultimately differentiate tort claims from takings claims because, as discussed above, the extent of United States's liability for takings is also dependent upon Congress's decision to waive the sovereign immunity of the United States.

Adhering to the Court's longstanding rule that claims that government action has resulted in a physical taking of private property requires a showing of a permanent (or at least indefinite) invasion or occupation of private property, the Court should affirm the judgment below rejecting this takings claim.

III. In the Alternative, the Court Should Apply the Traditional *Penn Central* Framework.

For the reasons discussed, the Court should rule that the Federal Circuit properly rejected the claim on the ground that the government's action involves a temporary intrusion. However, if the Court rejects that argument (and also concludes that the doctrine of sovereign immunity does not bar the claim), the Court should recognize that the claim must be analyzed using the traditional *Penn Central* framework. The *Penn Central* framework represents, as discussed above, the "polestar" of the Court's modern takings jurisprudence and there would be no good reason to depart from that framework in this case. Following *Penn Central*, virtually every Supreme Court decision applying a takings test to a cognizable property

interest – apart from those governed by the Court's narrow *per se* rules – has utilized the *Penn Central* framework. The only notable exceptions are cases applying the distinctive test long applied in the specialized utility rate-making context, *see, e.g.*, *Duquesne Light Co. v. Barasch*, 488 U.S. 299 (1989), so-called exactions cases involving physical takings imposed as a condition of regulatory authorizations, *see Lingle v. Chevron USA*, 544 U.S. 528, 538, 546 (2005), and cases involving the now-repudiated "substantially advances" takings test. *See, e.g., Agins v. City of Tiburon*, 447 U.S. 255 (1980). In addition, extensive litigation in this Court as well as the lower courts over the last several decades has significantly clarified the *Penn Central* analysis, producing a reasonably coherent and predictable body of law. *See, e.g.*, Thomas W. Merrill, *The Character of the Governmental Action*, 36 Vt. L. Rev. 649 (2012). There would simply be no reason to depart from the *Penn Central* framework in this case.

On the other hand, it would be a serious mistake to embrace a novel, *sui generis* takings standard for non-permanent flooding cases, or even physical intrusion cases more generally, as suggested (in quite different versions) both by Petitioner and Respondent. *See* Pet. Br. at 27, Resp. Br. at 14-15. Such a course would needlessly complicate takings doctrine and introduce an artificial formalism into the law. Litigation over when to apply a *per se* takings test or the *Penn Central* framework already consumes undue attention from the federal and state courts. *See, e.g.*,

Casitas Municipal Water Dist. v. United States, 543 F.3d 1276 (Fed. Cir. 2008) (debating whether a taking claim based on regulatory mandate to direct water through a fish ladder represents a physical taking or a potential regulatory taking); *Coast Range Conifers, LLC v. State of Oregon*, 117 P.3d 990 (Or. 2005) (addressing whether regulatory constraints on commercial timber operations represent a physical taking or a potential regulatory taking). No good purpose would be served by embracing yet another doctrinal innovation in the takings realm that would require further judicial policing of the boundaries between different takings tests.

Given that the *Penn Central* framework represents the Court's default takings standard, it is hardly surprising that the Court has assumed, albeit in *dictum*, that a takings claim based on a temporary occupation or invasion would be governed by *Penn Central*. *See Loretto*, 458 U.S. at 435 n. 12; *Lingle*, 544 U.S. at 539. For the reasons discussed, *amici curiae* believe that the Court was mistaken in assuming, in *dictum* and without extended analysis, that the Takings Clause even applies to temporary physical intrusions. But passing that fundamental point, there would be no reason not to conclude, if the Takings Clause applies in this context, that *Penn Central* provides the appropriate analytic framework.[7]

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[7] Some of petitioner's *amici curiae* go even further and advocate application of a *per se* takings rule for temporary

(Continued on following page)

Applying the *Penn Central* framework to this case would unquestionably lead to the conclusion that the claim was properly rejected. While Petitioner has claimed not insubstantial property damage, the alleged intrusion was temporary in nature, merely involved modest additional inundation of an area that was already subject to regular inundations, and the alleged damage to the timber stand itself was temporary in nature. On the other hand, the Petitioner can hardly claim any extensive interference with investment-backed expectations, given the inherent hazards of property ownership in a floodplain and the very qualified nature of riparian land rights under Arkansas law. Finally, with respect to the character of the government action, the Army Corps of Engineers was faced with the classic responsibility of having to make a choice between harming one class of property or another, *see Miller v. Schoene*, 276 U.S. 272 (1928), the kind of choice that in fairness and justice cannot give rise to takings liability. *See Armstrong v. United States*, 364 U.S. 40, 49 (1960).

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invasions or occupations, effectively expanding *Loretto*'s narrow rule for permanent physical invasions or occupations to all invasions or occupations regardless of their duration. The Court should certainly reject this radical proposal. There is no shred of support in the Court's prior decisions or common sense for this idea. For the reasons discussed, adoption of this proposal would have devastating adverse effects on local governments across the United States.

CONCLUSION

For the foregoing reasons, the Court should affirm the judgment below.

Respectfully submitted,

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September 4, 2012

AMICUS CURIAE BRIEF

RECORD AND BRIEFS

No. 11-597

Supreme Court, U.S.
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10

In The Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,

Petitioner,

v.

UNITED STATES,

Respondent.

ON PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA

BRIEF AMICUS CURIAE OF NATIONAL FEDERATION OF INDEPENDENT BUSINESS SMALL BUSINESS LEGAL CENTER, NATIONAL ASSOCIATION OF HOME BUILDERS, AMERICAN FARM BUREAU FEDERATION, AMERICAN FOREST RESOURCE COUNCIL, AND CENTER FOR CONSTITUTIONAL JURISPRUDENCE IN SUPPORT OF PETITIONER

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QUESTION PRESENTED

Does a temporary physical invasion and occupation of private property give rise to a categorical duty to compensate for damages caused to the property?

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INTEREST OF AMICI CURIAE[1]

Pursuant to Supreme Court Rule 37, the National Federation of Independent Business Small Business Legal Center (NFIB Legal Center), the National Association of Home Builders (NAHB), the American Farm Bureau Federation (Farm Bureau), American Forest Resource Council (AFRC), and the Center for Constitutional Jurisprudence (CCJ) submit this brief amicus curiae in support of Petitioner Arkansas Game & Fish Commission.

The NFIB Legal Center is a nonprofit, public interest law firm established to provide legal resources and be the voice for small businesses in the nation's courts through representation on issues of public interest affecting small businesses. The National Federation of Independent Business (NFIB) is the nation's leading small business association, representing members in Washington, D.C., and all 50 state capitals. Founded in 1943 as a nonprofit, nonpartisan organization, NFIB's mission is to promote and protect the rights of its members to own, operate and grow their businesses.

NFIB represents over 300,000 member businesses nationwide, and its membership spans the spectrum of business operations, ranging from

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[1] Counsels of record have consented to the filing of this brief. Letters evidencing Petitioner's consent have been filed with the Clerk of Court, and Respondent has filed a blanket consent. In accordance with Rule 37.6, NFIB Legal Center, NAHB, Farm Bureau, AFRC, and CCJ state that no counsel for a party authorized any portion of this brief and no counsel or party made a monetary contribution intended to fund the brief's preparation or submission.

sole proprietor enterprises to firms with hundreds of employees. While there is no standard definition of a "small business," the typical NFIB member employs 10 people and reports gross sales of about $500,000 a year. The NFIB membership is a reflection of American small business.

To fulfill its role as the voice for small business, the NFIB Legal Center frequently files amicus briefs in cases that will impact small businesses. The Legal Center files in this case because many small businesses own land, and lack the financial resources to absorb substantial devaluation, or destruction, of their properties. As such, small business owners are particularly interested in the physical takings doctrine, and in ensuring that this Court offers predictable and workable rules to guide the lower courts in the takings inquiry.

NAHB is a Washington, D.C.-based trade association whose mission is to enhance the climate for housing and the building industry. Chief among NAHB's goals is providing and expanding opportunities for all people to have safe, decent, and affordable housing. Founded in 1942, NAHB is a federation of more than 800 state and local associations. About one-third of NAHB's more than 130,000 members are home builders or remodelers, and its builder members are responsible for about 80 percent of all housing constructed each year in the United States.

NAHB is a vigilant advocate in the nation's courts. It frequently participates as a party litigant

and *amicus curiae* to safeguard the constitutional and statutory rights and business interests of its members and those similarly situated. NAHB has participated before this Court as *amicus curiae* or "of counsel" in a number of cases involving landowners aggrieved by inequitable treatment under a wide array of statutes and regulatory programs. NAHB's policies have long advocated that the Taking Clause must be given the same respect as all other constitutional rights. Essential to this is that government must pay just compensation if it physically invades a person's property.

The Farm Bureau is a voluntary general farm organization established in 1919 to protect, promote, and represent the business, economic, social, and educational interests of American farmers and ranchers. The Farm Bureau has member organizations in 50 states and Puerto Rico, representing more than 6.2 million member families. It has regularly participated as *amicus curiae* in this Court in cases involving the interpretation of the Takings Clause of the Fifth Amendment to the Constitution. The Farm Bureau's members own or lease substantial amounts of land, on which they depend for their livelihoods and on which all Americans depend for the supply of high quality, affordable food, fiber, and other basic necessities. Because their land may be subject to flooding, in order to relieve pressures on upstream dams and levees, farmers have great interest in ensuring that they can seek just compensation when their farmlands and soils are damaged or destroyed by government induced flood-invasions.

AFRC is an Oregon nonprofit corporation that represents the forest products industry throughout Oregon, Washington, Idaho, Montana, and California. AFRC represents over 50 forest product businesses and forest landowners. AFRC's mission is to create a favorable operating climate for the forest products industry, ensure a reliable timber supply from public and private lands, and promote sustainable management of forests by improving federal laws, regulations, and policies regarding management of forest lands. AFRC members have a great interest in ensuring that their forest lands are not taken without just compensation, and they have asserted their property rights in takings cases involving government regulation of forest land for spotted owls.

The Center for Constitutional Jurisprudence is the public interest law arm of the Claremont Institute, the mission of which is to restore the principles if the American Founding to their rightful and preeminent authority in our national life, including the proposition expressed in the Fifth Amendment that private property can be taken only for public use, and then only upon payment of just compensation. In addition to providing counsel for parties at all levels of state and federal courts, the Center has participated as amicus curiae before this Court in several cases of constitutional significance, including *Kelo v. New London*, 545 U.S. 469 (2005), and *Rapanos v. United States*, 547 U.S. 715 (2006).

SUMMARY OF ARGUMENT

Petitioner, Arkansas Game & Fish Commission (Commission), seeks just compensation for damage caused by Respondent's, United States Army Corps of Engineers (Army Corps), calculated decision to deviate from longstanding policies that governed the volume and length of water-releases from the Clearwater Dam in southeast Missouri. These deviations resulted in eight years of recurrent flood invasions, which ultimately destroyed numerous trees on the Commission's downstream property. For the following reasons this Court should recognize that Army Corps physically invaded the Commission's property, requiring just compensation under the Fifth Amendment.

Government assumes a categorical duty to pay just compensation for any physical invasion of private property, regardless of how long the ensuing occupation persists. *Per se* liability arises at the time of the initial invasion because—in rejecting the parcel as a whole rule—the physical takings doctrine holds that the physical occupation of any temporal segment of real property constitutes a burden for which just compensation is owed. Thus the length of the physical occupation is irrelevant to the question of whether a taking occurred. The length of the occupation matters only with regard to the amount of compensation owed.

Finally, Amici NFIB Legal Center, NAHB, Farm Bureau and AFRC argue that a taking is apparent here, even under the basic principles of fairness and justice outlined in *Armstrong v. United*

States, 364 U.S. 40 (1960); however, amici caution this Court against adopting a balancing test here because such tests have proven unworkable in the past. A balancing test would place both government actors and landowners in the precarious position of having to guess as to how a court might weigh competing factors. In the absence of bright line rules, government actors and landowners will have little guidance as to when a physical takings claim will ripen. This places property owners in a particularly unenviable position because government attorneys will almost invariably argue that a temporary physical takings claim has been brought either too early or too late.

I. GOVERNMENT ASSUMES A CATEGORICAL DUTY TO PAY JUST COMPENSATION WHENEVER IT INVADES PRIVATE PROPERTY, REGARDLESS OF WHETHER THE ENSUING OCCUPATION IS SHORT-LIVED

a. The Physical Takings Doctrine Requires Compensation for Temporary Occupations

In 1871 this Court first recognized that any "serious interruption to the common and necessary use of property..." will be equivalent to a taking, requiring compensation under the Constitution. *Pumpelly v. Green Bay Co.*, 80 U.S. 166, 179-180 (1871); *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 528 (2005) ("The paradigmatic taking requiring just compensation is a direct government appropriation

or physical invasion of private property.").[2] That principle has been unquestionably applied to hold government liable for any permanent invasion of private property. *United States v. Cress*, 243 U.S. 316, 327-328 (1917) (recognizing that existing precedent made clear that government assumes takings liability in creating a condition which results in permanent recurring floods); *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 425-426 (1982). A more vexing question has occasionally arisen as to whether temporary occupations give rise to takings liability as well. *Loretto*, 458 U.S. at 432 (questioning, in *dicta*, when a temporary takings claim may be consummated).[3] However, this Court has repeatedly affirmed the validity of temporary takings claims. *See Kimball Laundry Co. v. United States*, 338 U.S. 1 (1949) (just compensation owed when United States temporarily commandeered a laundry facility); *International Paper v. United States*, 282 U.S. 399 (1931) (requisition order allowing third parties to draw all

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[2] *United States v. Clarke*, 445 U.S. 253, 257 (1980) (the public duty to pay just compensation is self-executing).

[3] Despite *Loretto's* suggestion that temporary physical takings claims may be reviewed under a balancing test, that was not the *ratio decidendi* of the decision because it was not essential to its analysis in concluding that the permanent physical invasion was a *per se* taking in that case. *See* Dennis H. Long, *The Expanding Importance of Temporary Physical Takings: Some Unresolved Issues and an Opportunity for New Directions in Takings Law*, 72 Ind. L.J. 1185, 1194 (1997) ("This statement is at least partially dicta since *Loretto* was decided as a per se permanent physical taking."); *see Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 535 U.S. 302, 303 (2002) (Explaining that it is "inappropriate to treat" physical invasion cases as binding in regulatory takings cases).

of a river's flow constituted a temporary taking); *United States v. Petty Motor Co.*, 327 U.S. 372 (1946) (temporary taking recognized where government occupied leaseholds); *United States v. Dickinson*, 346 U.S. 389 (1953) (government was required to pay just compensation for flooding property, despite the fact the occupation was rendered temporary when the landowner managed to reclaim most of the submerged land). Indeed, our modern physical takings doctrine was borne in *United States v. Causby*, 328 U.S. 256, 259 (1946), a case in which takings liability was recognized for interference with property rights caused by—*temporary*—recurrent low–altitude flights over private property, which resulted in the loss of livestock.[4]

Although *Sanguinetti v. United States*, 264 U.S. 146, 149 (1924), created a degree of confusion in suggesting that an invasion must be permanent for takings liability to arise, subsequent cases have roundly rejected a temporal requirement in the physical takings doctrine.[5] *United States v. General Motors Corp.*, 323 U.S. 373, 382-384 (1945). The idea that an invasion must be permanent, or

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[4] "As a result of the noise, respondents had to give up their chicken business. As many as six to ten of their chickens were killed in one day by flying into the walls from fright. The total chickens lost in that manner was about 150."

[5] *Sanguinetti* misstated the proper rule, but this was *dicta* because the decision was ultimately resolved on the ground that there was no way to determine to what extent the federal public works project contributed to, or caused, the flooding of *Sanguinetti's* property. *Sanguinetti*, 264 U.S. at 149-150. To the extent that *Sanguinetti* has any applicability here, it is with regard to the requirement that Game & Fish must demonstrate that Army Corps' water release policies caused the damage to its property.

permanently-recurrent, to constitute a taking, can be traced back to a passing comment—also *dicta*—in *Cress*, 243 U.S. at 327-328. There the Court considered whether government assumed liability for a public works project that created a *permanent condition* causing recurrent intermittent flooding.[6] The Court noted in its analysis that "the findings... render[ed] it plain that this [was] not a case of temporary flooding or of consequential injury, but a permanent condition, resulting from the erection of [a] lock and dam, by which the land [was] 'subject to frequent overflows of water from the river.'" *Cress*, 243 U.S. at 327-328. The clear implication was that a different—perhaps more difficult—question would have been presented if government had caused only temporary flooding; however, later cases unquestionably provide that takings liability arises even from short-lived occupations. *See First English Evangelical Lutheran Church v. Los Angeles County*, 482 U.S. 304, 331-332 (1987) (Justice Stevens dissenting) ("The cases that the [majority] relies upon for the proposition that there is no distinction between temporary and permanent [regulatory] takings are inapposite, for they all deal with physical takings... None of those cases is controversial; the state certainly may not occupy an

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[6] "On occasion, a would-be doctrinal rule or test finds its way into our case law through simple repetition of a phrase-however fortuitously coined." *Lingle*, 544 U.S. at 528. This appears to be the case here because *Sanguinetti* drew from this language, inferring a rule from *dicta*. *See Sanguinetti*, 246 U.S. 146, 149. Even the Federal Circuit—in this case—cites *Cress* for the proposition that a taking must be permanent or must result in a permanent condition causing recurrent floods. *Arkansas Game & Fish Com'n v. U.S.*, 648 F.3d 1377, 1379 (Fed. Cir., 2011)

individual's home for a month and then escape compensation by leaving and declaring the occupation 'temporary.'"). That rule was again reaffirmed in *Tahoe-Sierra*, 535 U.S. at 322 (citing *United States v. Pewee Coal Co.*, 341 U.S. 114 (1951); *United States v. General Motors Corp.*, 323 U.S. 373 (1945); *Petty Motor Co.*, 327 U.S. 372 (1946)) (internal citations omitted).

b. Government has a Categorical Duty to Pay Just Compensation for the Physical Occupation of Any Segment of Real Property

i. The Physical Takings Doctrine Employs *Per Se* Rules in Rejecting the Parcel as a Whole Balancing Inquiry

Tahoe-Sierra explains that an estate in property entails both spatial and temporal dimensions. *Tahoe-Sierra*, 535 U.S. at 318 (citing Restatement of Property §§ 7–9 (1936)). Thus a property may be segmented in nearly infinite ways. A parcel of land can be physically divided into acres, or even down to square inches, and an estate, in any spatial segment of real property can be further divided into separate temporal terms. For example, an owner can theoretically divide his property into separate physical units, renting each out for a term of years, months, hours or even minutes.[7] In this

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[7] Short-term leases are commonplace. Mary Jane Angelo ET AL., *Small, Slow and Local: Essays on Building a More Sustainable and Local Food System*, 12 Vt. J. Envtl L. 353, 395 (2011) (Noting that "Americans presently rely on two

fashion, smaller estates may be incrementally carved from a larger estate. *See* Steven H. Gifts, Law Dictionary: Barron's Educational Series, 271 (3rd. Ed. 1991) ("A lease creates an estate in real property..."). Thus the physical takings doctrine recognizes takings liability when government acts to take any such estate, regardless of how narrow the interest taken may be when viewed either spatially or temporally.[8] *See Causby*, 328 U.S. at 265 (recognizing the duty to pay compensation even where government invades only an easement); *see e.g.*, *Loretto*, 458 U.S. at 436 (occupation of only a few inches constituted a taking); *see also General Motors*, 323 U.S. at 378 (recognizing government had taken an "estate in years").

This is necessarily the case because the physical takings doctrine unequivocally rejects the "parcel as a whole rule," and instead employs only the categorical rule that just compensation must be paid for what is taken. *Tahoe-Sierra*, 535 U.S. at 322 ("When the government physically takes possession of an interest in property for some public purpose, it has a categorical duty to compensate the former owner, regardless of whether the interest that is taken constitutes an entire parcel or merely a part thereof.") (Internal citations omitted); *see also Loretto*, 458 U.S. at 436 (rejecting the idea that a

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predominant forms of land tenure: full ownership (fee simple)... and short-term lease agreements...").

[8] Where government invades a property it is interrupting exclusive private ownership, and the private estate is therein encumbered to the extent of the invasion. Thus for example, a temporary occupation of a property held in fee simple absolute will sever the owner's estate into something less than a fee simple. *General Motors Corp.*, 323 U.S. at 378.

physical occupation must burden a requisite portion of real property before takings liability arises). Whereas the regulatory takings doctrine looks to the "parcel as a whole" in weighing whether a regulatory burden amounts to a taking, the physical takings doctrine rejects that approach in lieu of *per se* rules. *Tahoe-Sierra*, 535 U.S. at 303. In this regard the physical and regulatory takings doctrines stand in marked contrast. *Tahoe-Sierra* recognized this distinction as crucial in grappling with the question of when a temporary government action constitutes a taking.

In *Tahoe-Sierra* this Court considered whether a 32-month regulatory moratorium on construction amounted to a *per se* taking under *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992). The property owners argued that the *Lucas per se* test should apply because they had been completely deprived of the right to make any economic use of their property during the moratorium. The Court rejected that argument, and explained that the regulatory takings test looks to the impact of a restriction on the parcel as a whole, so as to prevent property owners from expediently "defining the property interest taken in terms of the very regulation being challenged." *Tahoe-Sierra*, 535 U.S. at 331. As such, the Court held that it is inappropriate to look at only a limited temporal segment of a property when considering whether a *regulation* has deprived the property owner of all economically beneficial uses. *Id.* at 303. For that reason, temporary regulatory takings claims are relegated to review under the balancing test set

forth in *Penn Central Transp. Co. v. New York City*, 483 U.S. 104 (1978).

Conversely, there is no basis for resorting to a balancing test when a temporal segment of property has been physically occupied. A balancing analysis is necessary in the context of a regulatory takings case because the actual impact of an abstract regulatory restriction can only be understood in view of what uses are allowed over the course of a property's full life. By contrast, in physical takings cases the extent of the invasion and the actual burden imposed are concrete and readily apparent; therefore, there is no need to balance the economic impact of a physical occupation against the value retained by the parcel as a whole. *Tahoe-Sierra*, 535 U.S. at 324. Moreover, without employing the parcel as a whole rule, there is simply no basis for saying that a physical occupation must be of a requisite magnitude—in terms of either space or time—to trigger the duty to pay just compensation. Accordingly, categorical liability necessarily arises even with temporary physical invasions.[9]

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[9] In practice a property owner would only bring a takings claim where the government has caused substantial enough damages to justify the costs of litigation. The daunting costs associated with bringing an inverse condemnation claim would discourage most potential litigants from seeking compensation for fleeting invasions. Furthermore, government would only be liable for damages caused to the property resulting from the temporary occupation.

ii. There is No Constitutional Basis for Excluding Temporary Physical Takings From the *Per Se* Rule

The Takings Clause provides that, "[P]rivate property [shall not] be taken for public use, without just compensation." CONST. Amend. V. Nothing in the text suggests a constitutional rubric for delineating how long an occupation must persist before it should be recognized as a taking. Yet, for that matter, nothing in the text indicates how much space must be occupied for a taking to be recognized either. *Loretto*, 458 U.S. at 436 ("Constitutional protection for the rights of private property cannot be made to depend on the size of the area permanently occupied."). In the absence of any constitutional grounding for a test weighing whether a physical occupation controls a substantial enough portion of a property to constitute a taking, *Loretto* explained that there is no conceptual basis for establishing a requisite threshold. *Id.* (The *per se* rule "avoids otherwise difficult line-drawing problems."). For the same reason, this Court should likewise refuse to establish a minimum temporal threshold here because there is no principled way to draw the line. *Vieth v. Jubelirer*, 541 U.S. 267, 278 (2004) ("[L]aw pronounced by courts must be principled, rational, and based upon reasoned distinctions.").

The Takings Clause was adopted to protect what the American Founders viewed as the natural rights to use and enjoy property "as embedded in the common law..." Edwin Meese III, The Heritage

Guide to the Constitution, 342 (David F. Forte, Sr. Ed., Mathew Spalding, Ex. Ed., Regnery Publishing, Inc., 2005). Thus *Loretto* held that the permanent occupation of any spatial segment of real property is subject to categorical protection under the Takings Clause because "the right to exclude emerged from the ancient protection against trespass." *Id.* at 343. But, the common law does not protect property owners against only *permanent occupations*; liability for trespass arises even for *fleeting invasions*.[10] Therefore, there is no more constitutional basis for imposing a minimum temporal requirement on physical takings claims than there is for imposing minimum spatial requirements. *See Petty Motor Co.*, 327 U.S. at 375 (summarily concluding that temporary occupation amounted to a taking); *see also* W. Blackstone, Commentaries; J. Lewis, Law of Eminent Domain in the United States 197 (1888) ("Any invasion of property... whether temporary or permanent, is a taking...") (footnote omitted).

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[10] At common law, the length of the invasion matters only in determining what damages are owed. Joseph F. Falcone III and Daniel Utain, *You Can Teach an Old Dog New Tricks: The Application of Common Law in Present Day Environmental Disputes*, 11 Vill. Envtl. L.J. 59, 110 (2000) ("Traditionally, under a common law nuisance or trespass action... temporary or abatable harms were remedied by the cost of repair to the land, whereas permanent harms considered the diminution in value to the property.").

iii. There is No Constitutional Basis for Denying Just Compensation by Appealing to Tort Concepts

Nor is there any constitutional basis for immunizing government actors from taking liability for temporary physical invasions on the theory that fleeting invasions are more properly characterized as torts than as takings. As this Court noted in *Monterey v. Del Monte Dunes, Ltd.*, 526 U.S. 687, 730 (1999), uncompensated takings are coextensive with—not exclusive from—tortious government action.[11] But, this area of the law has been confused by an unnecessary infusion of tort concepts in the lower courts. Arvo Van Alystene, *Inverse Condemnation: Unintended Physical Damage*, 20 Hastings L.J. 431, 431 (1969) (Noting "divergent approaches" and systemic confusion, as courts grapple with "a complex web of doctrinal threads" in assessing whether physical damage gives rise to takings liability, or merely a claim in tort).

The Federal Circuit has—to some extent—contributed to this confusion by developing a threshold test to supposedly distinguish "potential physical takings from possible torts." *Ridgeline Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003). This focus on the distinction between tort and takings claims tends to distract reviewing courts from the ultimate issue of whether a taking has been

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[11] "Nor... is the tort nature of the cause of action, and its entitlement to jury trial, altered by the fact that another cause of action was available (an inverse-condemnation suit) to obtain the same relief."

consummated.[12] Yet on serious examination, the *Ridgeline* test actually goes to the merits of the takings claim. *Ridgeline* first requires a showing that the owner has suffered a property loss resulting from an intentional invasion or from the "'direct, natural, or probable result of an authorized activity...'" *Ridge Line*, 346 F.3d at 1355 (internal citations omitted). Second the owner must demonstrate that a legally protected property interest has been appropriated. *Id.* But, this is merely a restatement of the elements of any physical takings claim: the property owner must demonstrate that he or she has (1) lost a cognizable property interest, (2) as a direct result of a government induced invasion. Steven Eagle, Regulatory Takings, Sec. 7-5 (3rd ed. 2005).

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[12] It would be inappropriate to appeal to tort concepts such as "negligence" and "reasonableness" in review of a takings claim because a taking is measured only in terms of the burden imposed on the property. Subjective considerations of negligence and reasonableness are impertinent to the question of whether a property has been burdened with an easement. *See Causby v. United States*, 328 U.S. at 266 (An easement is taken when there is a "direct" invasion interfering with the use and enjoyment of the property). Such considerations would be wholly irrelevant in a permanent flooding case, and it is difficult to imagine why they should be any more relevant if the occupation is only short-lived. After all, government's intent—or lack of intent—neither diminishes nor magnifies the severity of the burden suffered by the property owner. *See Lingle*, 544 U.S. at 529 (rejecting the "substantial advancement test" because it "reveals nothing about the *magnitude or character of the burden*" imposed) (emphasis in the original).

II. ARMY CORPS CONSUMMATED A TAKING WITH THE INVASION AND TEMPORARY OCCUPATION OF THE COMMISSION'S PROPERTY

a. Army Corps Assumed a Categorical Duty to Pay Just Compensation in Taking Away the Right to Exclude During its Flood-Invasion

Our takings jurisprudence has always recognized the right to exclude as the "fundamental element of the property right..." *Kaiser Aetna v. United States*, 444 U.S. 164, 179-80 (1979); *Hendler v. United States*, 952 F.2d 1364, 1374 (Fed. Cir. 1991) ("In the bundle or rights we call property, one of the most valued is the right to sole and exclusive possession-the right to exclude strangers, or for that matter friends, but especially the Government."). Accordingly, if the right to exclude is taken, "property" has effectively been taken. *Kaiser Aetna*, 444 U.S. at 179-80. Therefore, evidence that the Army Corps directly caused a flood-invasion is dispositive of the takings inquiry. *General Motors*, 323 U.S. at 378. A taking is evident because the right to exclude was necessarily taken away with the initiation of the flood-invasion.

The fact that the Army Corps eventually ceased its invasive activities does not change the reality that the right to exclude was taken. The Commission lost the rights of exclusive possession and dominion over its land throughout the duration of the recurring invasions. During this time, the Commission's estate in the property was

encumbered by a unilaterally asserted dominant servitude. Therefore, the Army Corps took a narrow interest in the Commission's property. *See U.S. v. Virginia Elec. & Power Co.*, 365 U.S. 624, 627 (1961) ("It is indisputable... that a flowage easement is 'property' within the meaning of the Fifth Amendment."). [13] The only remaining question is how to value the interest taken? *Id.* at 630 ("The valuation of an easement upon the basis of its destructive impact upon other uses of the servient fee is a universally accepted method of determining its worth.").

b. A Taking Must Also be Recognized Under *Armstrong* by Virtue of the Fact the Commission's Property was Destroyed

During any physical invasion the fundamental right of exclusion is taken away for the time the occupation persists. But where the invasion causes destruction, that injury is coupled with injuries to other rights. Notwithstanding the—often devastating—impact that a temporary physical invasion may cause in destroying a home, place of

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[13] A flowage easement allows the easement holder to divert water over a servient property. The government may attain a flowage easement either through a formal condemnation proceeding in eminent domain, or informally by effecting a flood-invasion. *United States v. Dickinson*, 331 U.S. 745, 747-748 (1947) ("The Government could... have taken appropriate proceedings, to condemn as early as it chose, both land and flowage easements. By such proceedings it could have fixed the time when the property was 'taken.' The Government chose not to do so. It left the taking to physical events..."); *Causby*, 328 U.S. at 267 ("[A]n accurate description of the property taken is essential, since that interest vests in the United States.").

business or other valuable resources, the Federal Circuit's decision below holds that property owners are without protection under the Fifth Amendment in these cases. *See e.g., Big Oak Farms v. United States*, 2012 WL 1570878, 4 (Fed. Cl.) (2012) (dismissing a takings claim for a temporary flood-invasion that "damaged plaintiff's land, crops, equipment, and infrastructure"). This simply cannot be squared with the bedrock principle of our takings jurisprudence that a property owner should not be forced to bear alone "public burdens, which in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960); *Lingle*, 544 U.S. at 529.[14] Nor can these decisions be squared with the categorical rule that a taking is consummated with the physical invasion of any segment of real property.

Here, the Army Corps argues that a temporary physical taking must be recurrent and must last longer than eight years; however, this analysis has no place in existing takings case law. *Lingle* 544 U.S. at 538 (recognizing only one physical takings test). There is no reason why the frequency or length of an occupation should matter to the takings inquiry, except to the extent that it may be assumed that the burden imposed upon the property owner becomes more significant the longer an occupation persists. But, if the imposition of an unjust burden is the true mark of a taking, then a

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[14] It should be noted that government is presumed to act in the public interest when effecting policy decisions, public works projects, and other government functions. Therefore property destroyed or damaged as a result of legitimately initiated government action has been appropriated for the purpose of advancing the public good. *See General Motors*, 323 U.S. at 378.

takings claim cannot be disposed of simply because the invasion was fleeting or non-recurrent.

Here the essential rights to use, possess and dispose of the Commission's property were completely annihilated with the destruction of its trees.[15] *Loretto*, 458 U.S. at 435 (indicating that a taking occurs when the government action may be said to "chop through the bundle [of property rights], taking a slice of every strand."); *General Motors Corporation*, 323 U.S. at 378 ("destruction is tantamount to taking..."). Indeed, an owner cannot reasonably use property that has been destroyed or severely damaged. Nor can the owner meaningfully possess a property at that point.[16] Finally, even the

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[15] Even under *Loretto's* suggested balancing approach a taking is evident where—as in this case—property is damaged or destroyed. *Loretto* suggested that the burden of a temporary invasion must be weighed in consideration of the actual impact it has on the owner's rights to use, possess and dispose of the property in question. *Loretto*, 458 U.S. at 435 (citing a temporary taking case). Yet there is no need to resort to an *ad hoc* balancing approach; a taking is readily apparent here because the Commission lost all of its rights with regard to the portion of its property destroyed by the Army Corps water-release policies.

[16] If property has been entirely destroyed then the right to possess has been completely taken away. But, even where the property remains in existence, the owner has lost the right of meaningful possession if it can longer be used. Moreover, in the case of homes, or other structures, severe damage will generally raise health and safety issues, which would render them uninhabitable or otherwise in violation zoning codes, or other state and local laws. *See e.g.*, City of Northglenn Zoning Code, Section 10-15-6(g)(Subsection 403(1) ("Any building declared a dangerous building under this Code shall be made to comply with one of the following... [t]he building shall be repaired, rehabilitated or remediated in accordance with the

meaningful right to dispose of a property is taken away when government destroys the property and or its value. J. Gregory Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation of the Internet*, 2 J. Competition L. & Econ. 349, 377 (2006) ("The right to dispose of property includes the right to sell, lease, or otherwise subdivide the use of the property over space, time, and any other feasibly defined dimension."); *Lucas*, 505 U.S. at 1017, 112 S.Ct. 2886 ("[F]or what is the land but the profits thereof[?]") (*quoting* 1 E. Coke, Institutes, ch. 1, § 1 (1st Am. ed. 1812)). Those rights are *permanently* taken away with regard to the segment of property that has been damaged or destroyed.

Moreover, a taking must be recognized whenever property is destroyed because such an imposition is necessarily more burdensome than the paradigmatic taking recognized in *Loretto*. It would be entirely illogical to say that the permanent placement of a simple cable imposes a greater burden on a property owner than the burden suffered by another who has lost a home, a business, or other valuable resources as a result of a temporary invasion. It does not matter how fleeting the invasion might be when the essential rights to meaningfully use, possess and dispose of physically damaged structures and resources have been *permanently* impaired. Indeed,

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current building code, health code, resolution or standards, or other current code applicable... [or] the building shall be demolished at the option of the building owner... [or] if the building does not constitute an immediate danger to life, limb, property or safety of the public it may be vacated, secured and maintained against entry."); *see also Oswalt v. Ramsey County*, 371 N.W.2d 241, 247 (Minn.App.,1985) (Addressing a zoning code that prohibited repair of damaged property).

if the permanent placement of a cable imposes a burden requiring just compensation "in all fairness and justice," then—*a fortiori*—the permanent destruction of the building upon which the cable is attached requires just compensation all the more. Accordingly, the destruction of the Commission's trees should be compensated in all fairness and justice.

III. A BRIGHT-LINE RULE SHOULD APPLY BECAUSE A BALANCING TEST WOULD CREATE TREMENDOUS UNCERTAINTY AS TO WHEN A TAKINGS CLAIM SHOULD BE BROUGHT

This Court should eschew any *ad hoc* balancing approach in favor of a definitive *per se* rule recognizing that a taking is consummated at the time there is a physical invasion of private property. Balancing tests have proven entirely unworkable under this Court's regulatory takings doctrine, and for that reason should be avoided here where a bright-line is concrete and easily discerned. *See* R.S. Radford & Luke A. Wake, *Deciphering and Extrapolating: Making Sense of Penn Central*, 36 Ecology L.Q. 731, 735 (2011) (observing that the *Penn Central* balancing test remains shrouded in a "formless, directionless haze," and noting the near invariable calls for further guidance from courts and commentators). Indeed, in the 32 years since *Penn Central* relegated (most) regulatory takings claims to its multi-factor balancing test, that area of takings jurisprudence has become a veritable jungle of contradictory opinions. *See* John D. Echeverria, *Making Sense of Penn Central*, 23 UCLA J. Envtl. L.

& Pol'y 171, 175 (2005) (arguing that the *Penn Central* balancing test serves as nothing more than "legal decoration for judicial rulings based on intuition..."). *Penn Central* and its progeny have remained rudderless and commentators invariably agree that neither property owners nor government regulators have any way of rationally assessing takings liabilities under that regime. Steven J. Eagle, *Some Permanent Problems With the Supreme Court's Temporary Regulatory Takings Jurisprudence*, 25 U. Haw. L. Rev. 325, 352 (2003) ("[E]mphasis on balancing tests gives... no one much predictability."). If the Court were to endorse an *ad hoc* balancing test for temporary physical takings cases, the same would be true here as well.

Without a bright-line rule, regulators would have little guidance as to when physical takings liability would arise. Likewise property owners would have to guess as to how a court would balance competing factors if they should bring a claim. "The need for greater uniformity, consistency, and predictability is particularly pressing in the physical damage cases, for they comprise the single most significant class of inverse condemnation claims, whether measured numerically or in terms of the magnitude of potential liabilities." Van Alstyne, *supra* at 432.

Yet aggrieved property owners would be in a particularly unenviable position if a balancing test governs. If the owner has already suffered catastrophic losses he or she may not be in a position to continue waiting to be sure that an inverse condemnation claim has ripened. Moreover, it is

foreseeable that zealous government attorneys will invariably argue that the suit has been brought too soon. *See* William M. Hof, *Trying to Halt the Procedural Merry-Go-Round: The Ripeness of Regulatory Takings Claims After Palazzolo v. Rhode Island*, 46 St. L. Univ. L. J. 833, 833-835 (2002) (noting that property owners seeking to ripen a regulatory takings claim are often caught in a seemingly endless procedural merry-go-round). Still the same attorneys would predictably argue that a landowner has waited too long to initiate an inverse condemnation claim if the physical occupation has already persisted for any substantial length of time, provided that the statute of limitations defense could reasonably be raised. *See e.g., CRV Enterprises, Inc. v. United States*, 626 F.3d 1241 (Fed. Cir. 2010) (when the property owner advanced a takings claim in 2003 the United States argued that the claim was unripe, but subsequently argued that the claim was barred by the statute of limitations when it was reinitiated in 2006).

CONCLUSION

This Court should reverse the Federal Circuit and hold that Respondent took a temporary flowage easement over Petitioner's property.

Respectfully submitted,

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AMICUS CURIAE BRIEF

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Petitioner,

v.

UNITED STATES,

Respondent.

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

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QUESTION PRESENTED

Petitioner Arkansas Game & Fish Commission, a constitutional entity of the State of Arkansas, sought just compensation from the United States under the Takings Clause of the Fifth Amendment for physically taking its bottomland hardwood timber through six consecutive years of protested flooding during the sensitive growing season. The Court of Federal Claims awarded $5.7 million, finding that the Army Corps of Engineers' actions foreseeably destroyed and degraded more than 18 million board feet of timber, left habitat unable to regenerate, and preempted Petitioner's use and enjoyment. The Federal Circuit, with its unique jurisdiction over takings claims, reversed the trial judgment on a single point of law. Contrary to this Court's precedent, a sharply divided 2-1 panel ruled that the United States did not inflict a taking because its actions were not permanent and the flooding eventually stopped. The Federal Circuit denied rehearing en banc in a fractured 7-4 vote. The question presented is:

Whether government actions that impose recurring flood invasions must continue permanently to take property within the meaning of the Takings Clause.

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IDENTITY AND INTEREST OF AMICUS CURIAE

Owners' Counsel of America (OCA) is a national network of the most experienced eminent domain and property rights attorneys who seek to advance, preserve and defend the rights of private property owners and thereby further the cause of liberty, because the right to own and use property is "the guardian of every other right" and the basis of a free society. *See* JAMES W. ELY, THE GUARDIAN OF EVERY OTHER RIGHT: A CONSTITUTIONAL HISTORY OF PROPERTY RIGHTS (2d ed. 1998).[1]

As the lawyers at the front lines of takings law, OCA's members understand the importance of the issues in this case, and how the rule adopted by the Federal Circuit, if allowed to stand, will undermine the check on the unbridled exercise of governmental powers that the Takings Clause provides. Physical destruction of property is no less a taking simply because the events that caused it were temporary.

OCA brings unique expertise to this task. OCA is a non-profit member-based organization, organized under IRC § 501(c)(6) and sustained solely by its

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[1] All counsel of record consented to the filing of this brief. This brief was not authored in any part by counsel for either party, and no person or entity other than amicus made a monetary contribution toward the preparation or submission of this brief.

members. Only one member lawyer is admitted from each state. Since its founding, OCA has sought to use its members' combined knowledge and experience as a resource in the defense of private property ownership, and to make that opportunity available and effective to property owners nationwide. OCA member attorneys have been involved in landmark takings law cases in nearly every jurisdiction nationwide, including cases at issue in the case at bar. Additionally, OCA members and their firms have been counsel for a party or amici in many of the eminent domain and takings cases this Court has considered in the past forty years. *See, e.g.*, *Kaiser Aetna v. United States*, 444 U.S. 164 (1979); *Agins v. City of Tiburon*, 447 U.S. 255 (1980); *First English Evangelical Lutheran Church v. Los Angeles County*, 482 U.S. 304 (1987); *Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825 (1987); *Yee v. City of Escondido*, 503 U.S. 519 (1992); *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992); *Dolan v. City of Tigard*, 512 U.S. 374 (1994); *City of Monterey v. Del Monte Dunes at Monterey, Ltd.*, 526 U.S. 687 (1999); *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001); *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302 (2002); *San Remo Hotel, L.P. v. City and County of San Francisco*, 545 U.S. 323 (2005); *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528 (2005); *Kelo v. City of New London*, 545 U.S. 469 (2005); *Winter v. Natural Res. Def. Council*, 555 U.S. 7 (2008). Most recently, OCA filed an amicus brief in *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Envt'l Protection*, 130 S. Ct. 2592 (2010).

OCA members have also authored treatises, books, and law review articles on takings, eminent domain, and compensation, including chapters in the seminal treatise NICHOLS ON EMINENT DOMAIN. *See, e.g.*, MICHAEL M. BERGER, TAKING SIDES ON TAKINGS ISSUES (Am. Bar Ass'n 2002) (chapter on: *What's "Normal" About Planning Delay?*); Michael M. Berger, *Supreme Bait & Switch: The Ripeness Ruse in Regulatory Takings*, 3 WASH. U.J.L. & POLICY 99 (2000); Michael M. Berger & Gideon Kanner, *Thoughts on the White River Junction Manifesto: A Reply to the "Gang of Five's" Views on Just Compensation for Regulatory Taking of Property*, 9 LOY. L.A.L. REV. 685 (1986); WILLIAM G. BLAKE, THE LAW OF EMINENT DOMAIN – A FIFTY STATE SURVEY (Am. Bar Ass'n 2012) (editor); LESLIE A. FIELDS, COLORADO EMINENT DOMAIN PRACTICE (2008); JOHN HAMILTON, KANSAS REAL ESTATE PRACTICE AND PROCEDURE HANDBOOK (2009) (chapter on *Eminent Domain Practice and Procedure*); JOHN HAMILTON & DAVID M. RAPP, LAW AND PROCEDURE OF EMINENT DOMAIN IN THE 50 STATES (Am. Bar Ass'n 2010) (Kansas chapter); Gideon Kanner, *Making Laws and Sausages: A Quarter-Century Retrospective of Penn Central Transportation Co. v. City of New York*, 13 WM. & MARY BILL OF RTS. J. 679 (2005); Michael Rikon, *Moving the Cat into the Hat: The Pursuit of Fairness in Condemnation, or, Whatever Happened to Creating a "Partnership of Planning?"*, 4 ALB. GOV'T L. REV. 154 (2011); Randall A. Smith, *Eminent Domain After Kelo and Katrina*, 53 LA. BAR J. 363 (2006); ROBERT H. THOMAS, EMINENT DOMAIN: A HANDBOOK ON CONDEMNATION LAW (Am. Bar Ass'n

2011) (chapters on *Prelitigation Process*, *Flooding and Erosion*); Robert H. Thomas, *et al.*, *Of Woodchucks and Prune Yards: A View of Judicial Takings From the Trenches*, 35 VT. L. REV. 437 (2010).

OCA believes that its members' long experience in advocating for property owners and protecting their constitutional property rights will provide an additional, valuable viewpoint on the issues presented to the Court.

SUMMARY OF ARGUMENT

This case presents the court with an opportunity to bring a measure of long-absent clarity to one part of takings law. A physical invasion of property – even that which is deemed "temporary" – is a taking and triggers the Fifth Amendment's requirement to pay just compensation. Thus, the government cannot avoid liability for a taking when it floods property simply by asserting that it did not intend for the invasion to be permanent. Temporal metaphysics are less important than the actual permanent damage and deprivation of use inflicted by an invasion.

When property is damaged permanently, as were petitioner's trees, there is no principled distinction between a physical invasion that is permanent and compensable, and an invasion that is claimed to be temporary and is not. The Federal Circuit, however, concluded otherwise and drew artificial and unenforceable lines between "temporary" flooding and "permanent" invasions, with the only delineation

between them being the intent of government officials. This Court should reverse, and reaffirm the rule that *any* physical invasion of private property that results in a deprivation of the property owner's use requires the payment of just compensation.

This brief makes a single point: the Federal Circuit's *per se* rule of nonliability has it exactly backwards, and this Court should reaffirm the rule that all "direct and substantial" physical occupations, even if temporary, are takings. In those cases, the duration of the invasion is a factor in the calculation of just compensation, not whether a taking has occurred.

ARGUMENT

In an area of law in which the Court generally eschews bright-line rules, *see Palazzolo v. Rhode Island*, 533 U.S. 606, 636 (2001) ("The temptation to adopt what amount to *per se* rules in either direction must be resisted."), two categories of government actions nonetheless result in *per se* liability under the Takings Clause. First, a taking occurs when the effect of the government action is to deprive property of its economically beneficial uses. *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1015 (1992). Second, when the government has "compel[led] the property owner to suffer a physical 'invasion' of his property," the government must pay just compensation. *Id.* (citing *Kaiser Aetna v. United States*, 444 U.S. 164 (1979) (imposition of navigational servitude on private

waterway was a taking); *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1987) (requirement that property owner allow installation of small cable TV box a taking); *United States v. Causby*, 328 U.S. 256, 265 & n.10 (1946) (invasion of airspace)). *See also Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825 (1987) (exaction of public access easement as a condition of development approvals is a taking). While recognizing that invasions assumed to be permanent do not require a case-specific inquiry into the public interest supporting the action and do not require a physically large intrusion, *see Lucas*, 505 U.S. at 1015 (permanent "minute" intrusions require compensation), this Court has never fixated on an artificial distinction between "permanent" and "temporary" invasions to determine liability, much less adopted the Federal Circuit's absolute rule that invasions deemed "permanent" are takings, while those deemed "temporary" are not. Instead, this Court has applied the rule that any direct and substantial occupation of private property is a taking, and requires compensation even if temporary.

Under this rule, only in unusual circumstances will physical invasions not be treated as takings. For example, in *Nat'l Bd. of YMCA v. United States*, 395 U.S. 85 (1969), this Court concluded that the government was not liable for a taking when rioters damaged a building after military troops temporarily occupied it. *Id.* at 92. The occupation was not planned and was extremely brief – the troops occupied the building for a single night – and the rioters inflicted the majority of the damage to the building prior to

the government occupation. Moreover, the troops did not actually interfere with the owner's use of the building, since it was already under siege by the rioters. *Id.* at 93. Consequently, the Court held that there was no taking because "the physical occupation by the troops did not deprive petitioners of any use of their buildings," and "the temporary, unplanned occupation of petitioners' buildings in the course of battle does not constitute direct and substantial enough government involvement to warrant compensation under the Fifth Amendment." *Id.*

The rule to be gleaned from *YMCA* is that government invasions that are "direct and substantial" interferences with property owners' right to exclude and deprive them of use of their property are takings and require compensation regardless of the duration of the invasion. In the case at bar, the flooding of petitioner's property and the resultant destruction of its trees certainly qualify under this standard. Thus, the mere facts that the flooding was not infinite, and that the government may not have intended to continue its conduct forever, are not dispositive, and are no bar to recovery.

Eminent domain law has never drawn a distinction between a temporary taking and a permanent taking for liability purposes; rather, the duration of the seizure is one of the factors to be considered when calculating just compensation. When condemning property, the government is not required to take an infinite fee simple absolute estate. Thus, the government is liable to pay compensation when it temporarily uses private property. *See, e.g., Kimball Laundry Co. v. United States*, 338 U.S. 1 (1949).

Compensation is also owed if the government abandons a taking voluntarily or otherwise, thus rendering it "temporary." *See First English Evangelical Lutheran Church v. Los Angeles County*, 482 U.S. 304 (1987). Similar rules should govern inverse condemnation actions, since takings law is premised on the idea that in certain instances, the government is obligated to pay compensation even if it has not invoked its eminent domain power. *Id.* at 316. ("While the typical taking occurs when the government acts to condemn property in the exercise of its power of eminent domain, the entire doctrine of inverse condemnation is predicated on the proposition that a taking may occur without such formal proceedings."). Any questions identifying the duration of the occupation should be issues of compensation, not liability:

> The extent of impairment, like the duration of the intrusion, is not irrelevant. The greater the impairment, the more compensation required. If the owner's use of the property is not impaired at all, then maybe no compensation should be required. But that is not because the land was not taken. It is because justice may not require compensation for a taking that does not impair the owners use at all.

Alan Romero, *Takings by Floodwaters*, 76 N.D. L. REV. 785, 789 (2000). *See also United States v. Cress*, 243 U.S. 316, 328 (1917) ("so long as the damage is substantial, that determines the question [of] whether there is a taking").

For example, the Virginia Supreme Court recently concluded that a single instance of flooding can result in government liability for inverse condemnation. In *Livingston v. Virginia Dep't of Transportation*, No. 101006 (Va. June 7, 2012), the court held that a one-time flood could be a taking. The plaintiffs claimed that in building the Beltway in the 1960's, the Virginia Department of Transportation (VDOT) straightened and relocated a portion of Cameron Run, a stream feeding into the Potomac River. The plaintiffs also claimed that VDOT failed to maintain the relocated channel in the intervening years, and the latter failure resulted in their homes being flooded with sewage after a massive rainfall in 2006. The owners whose homes were flooded filed an inverse condemnation action in state court to recover just compensation under the Virginia Constitution, which requires compensation when private property is taken or damaged for public use. The trial court sustained VDOT's demurrer, concluding that a single instance of flooding could not result in inverse condemnation liability. The Virginia Supreme Court reversed:

> To the extent that the circuit court held that a single occurrence of flooding cannot support an inverse condemnation claim, it erred. We find nothing in Article I, Section 11's text or history that limits a property owner's right to just compensation for a damaging to only multiple occurrences of flooding. Further, our case law holds that a single occurrence of flooding can support an inverse

> condemnation claim. In *Hampton Roads Sanitation District v. McDonnell*, 234 Va. 235, 360 S.E.2d 841 (1987), we said that a property owner could bring a new inverse condemnation suit against the City of Hampton Roads each time it discharged sewage onto his property. *Id.* at 239, 360 S.E.2d at 844. We explained: "[T]he original discharge of sewage in 1969 did not produce all the damage to the property. The discharges were not continuous; instead, they occurred only at intervals. Thus, *each discharge inflicted a new injury for which [the property owner] had a separate cause of action.*" *Id.* (emphasis added).

Livingston, slip op. at 11-12.

This same principle applies to the case at bar. There is no question that petitioner's trees have been permanently taken, and the fact that the damage was the result of multiple flood events means only that petitioner potentially had multiple causes of action, not that there was no taking at all. *Cf. Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 535 U.S. 302, 332 (2002) (temporary moratorium on all use is not a taking because "property will recover value as soon as the prohibition is lifted"). Here, petitioner's trees have been permanently damaged, and cannot recover their value even if the government-caused flooding was merely temporary.

Finally, the government's intent to limit the duration of the flooding, even if it could be established by extrinsic evidence, is not relevant to a

determination of whether a physical invasion is a taking. The Federal Circuit's attempt to distinguish a taking from a tort contradicts this Court's decisions beginning with *Pumpelly v. Green Bay Co.*, 80 U.S. 166 (1871), which hold that intent is not relevant to takings analysis. *Pumpelly* was also a flooding case, where the construction of a dam resulted in the plaintiff's property being inundated. The Court rejected the government's argument that it was not liable for a taking because the construction of the dam was a valid exercise of government power, and the damage caused by the flooding was merely a consequential result of that action. *Id.* at 177. Thus, it was the result of the government's valid exercise of power in damaging the plaintiff's property that mattered, not the government's intent (or, more accurately, its lack of intent) to take it. *Id.* at 177-78. The same reasoning applies to the claim that government's intent that its action is temporary or permanent is the controlling factor in determining whether a taking has occurred.

CONCLUSION

The judgment of the Federal Circuit should be reversed.

Respectfully submitted,

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AMICUS CURIAE BRIEF

No. 11-597

In the

Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,
Petitioner,

v.

UNITED STATES OF AMERICA,
Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF AMICUS CURIAE OF PACIFIC LEGAL FOUNDATION, CATO INSTITUTE, AND ATLANTIC LEGAL FOUNDATION IN SUPPORT OF PETITIONER

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QUESTION PRESENTED

Whether government actions that cause recurring floods that damage private property must be permanent in order to require payment of just compensation under the Takings Clause of the Fifth Amendment?

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INTEREST OF AMICI CURIAE[1]

Pacific Legal Foundation (PLF) was founded almost 40 years ago and is widely recognized as the largest and most experienced nonprofit legal foundation of its kind. PLF has participated in numerous cases before this Court both as counsel for parties and as amicus curiae. PLF attorneys litigate matters affecting the public interest at all levels of state and federal courts and represent the views of thousands of supporters nationwide who believe in limited government and private property rights. PLF attorneys participated as lead counsel in *Sackett v. EPA*, 132 S. Ct. 1367 (2012), *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001), *Suitum v. Tahoe Reg'l Planning Agency*, 520 U.S. 725 (1997), and *Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825 (1987), and participated as amicus curiae in *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528 (2005), and *City of Monterey v. Del Monte Dunes at Monterey, Ltd.*, 526 U.S. 687 (1999). Because of its history and experience with regard to issues affecting private property, PLF believes that its perspective will aid this Court in considering the arguments of the parties.

The Cato Institute was established in 1977 as a nonpartisan public policy research foundation

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[1] Pursuant to this Court's Rule 37.3(a), all parties have consented to the filing of this brief. Letters evidencing such consent have been filed with the Clerk of the Court.

Pursuant to Rule 37.6, Amici Curiae affirm that no counsel for any party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than Amici Curiae, its members, or its counsel made a monetary contribution to its preparation or submission.

dedicated to advancing the principles of individual liberty, free markets, and limited government. Cato's Center for Constitutional Studies was established in 1989 to help restore the principles of limited constitutional government that are the foundation of liberty. Toward those ends, Cato publishes books and studies, conducts conferences, publishes the annual *Cato Supreme Court Review*, and files amicus briefs, including in various cases concerning property rights. This case is of central concern to Cato because it implicates the safeguards the Fifth Amendment provides for the protection of property rights against uncompensated takings, irrespective of how they are characterized.

The Atlantic Legal Foundation (ALF) is a nonprofit, nonpartisan public interest law firm. It provides legal representation, without fee, to scientists, parents, educators, other individuals, small businesses, and trade associations. ALF's mission is to advance the rule of law in courts and before administrative agencies by advocating for limited and efficient government, free enterprise, individual liberty, school choice, and sound science. ALF's leadership includes distinguished legal scholars and practitioners from across the legal community. ALF has served as counsel for plaintiffs and amici in numerous takings cases, including *Cole v. Santa Barbara County*, 537 U.S. 973 (2002) (counsel for amici associations of small property owners in support of petition for certiorari in challenge to a state law procedural bar to claims for unconstitutional takings based on ripeness); *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302 (2002) (counsel for real property owners' associations as amici in challenge to development moratoria); *Brody v. Vill. of Port Chester*,

345 F.3d 103 (2d Cir. 2003) (co-counsel for plaintiff in challenge to taking of property for nonpublic use and inadequate notice of final decision to condemn under due process requirements of Fourteenth Amendment); and *Blecher v. Dep't of Hous. Pres. & Dev. of the City of New York*, S.D.N.Y. 92 Civ. 8760 (CSH) (1992) (counsel for small residential property owners in Fourteenth Amendment challenge to New York City Senior Citizen Rent Increase Exemption).

INTRODUCTION AND SUMMARY OF ARGUMENT

This case asks whether the Fifth Amendment's Takings Clause obligates the government to pay just compensation when it causes a river to flood private property for several years and, during that time, uses the land in a manner that destroys valuable property, permanently depriving the landowner of its use.

This Court has repeatedly recognized that a temporary physical invasion can give rise to a taking. *See, e.g., United States v. Pewee Coal Co.*, 341 U.S. 114 (1951); *States v. Causby*, 328 U.S. 256, 266-68 (1946). This recognition is based on the fundamental principle that the government must compensate a landowner to the extent that it actually invades private property, thereby exercising dominion over the landowner's rights and inflicting irreparable harm thereto. *Pumpelly v. Green Bay Co.*, 80 U.S. 166, 177-78 (1872).

The test for a physical taking is whether the government's invasion directly interferes with the landowner's rights to possess, use, or dispose of his or her property. *Causby*, 328 U.S. at 266 ("[I]t is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial,

that determines the question whether it is a taking."). A temporary invasion that causes substantial harm to the property is no different in kind than a permanent invasion; both have the effect of depriving an owner of his or her rights in the land. *United States v. Cress*, 243 U.S. 316, 328 (1917). And both require compensation. *Id.*

Petitioner Arkansas Game & Fish Commission (Commission) owns thousands of acres of hardwood forest in Arkansas' Upper Mississippi Alluvial Valley. Pet. Cert. App. A at 3a. This forest provides a variety of valuable uses, including the harvest of mature oak trees, recreational lands, hunting grounds for migratory water fowl, and conservation and habitat areas. Pet. Cert. App. B at 42a-44a.[2] Much of this land, and its use, was significantly damaged when the U.S. Army Corps of Engineers (Army Corps) employed a series of water management plans from 1993 to 2000 that caused six consecutive years of flooding and degraded nearly 18 million board feet of timber across about 23,000 acres of forest. Pet. Cert. App. A at 14a-15a; Pet. Cert. App. B at 40a, 140a-142a.

The Court of Federal Claims found that, during these floods, the "government's superinduced flows so profoundly disrupted certain regions of the Management Area that the Commission could no longer use those regions for their intended purposes, *i.e.*, providing habitat for wildlife and timber for

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[2] Because it decided the case as a matter of law, the Federal Circuit chose not to address the Court of Federal Claims' findings of fact. Pet. Cert. App. A at 22a ("we need not decide whether the flooding on the Management Area was sufficiently substantial to justify a takings remedy or the predicable result of the government's action") (quotation marks and citation omitted).

harvest." Pet. Cert. App. B at 92a. Although the Army Corps eventually stopped flooding the forest, the trial court concluded that "the damage done to the Commission's property interest in its timber was permanent . . . and the Commission was preempted from exercising its property rights over its timber during and after the Corp's deviations." Pet. Cert. App. B at 91a, 129a ("the government's temporary taking of a flowage easement over the Management Area resulted in a permanent taking of timber from that property"). The Court of Federal Claims concluded that the Army Corps' actions effected a taking and ordered the Corps to pay $5.5 million for the value of the timber destroyed by the floods, plus an additional $176,428.34 to restore the severely damaged portions of the Commission's recreation and conservation lands. Pet. Cert. App. A at 17a; Pet. Cert. App. B at 142a, 158a.

But, in a 2-1 decision, the Federal Circuit reversed the trial court's judgment, concluding that, as a matter of law, government flooding of private property can *never* constitute a taking if it was the result of an "ad hoc or temporary" government policy because, according to the court of appeals, temporary flooding can never give rise to a taking. Pet. Cert. App. A at 23a, 27a. Therefore, the majority reasoned, it was unnecessary to consider the extent to which the Army Corps' actions interfered with the Commission rights in its property. *Id.*

The Federal Circuit went too far when it adopted a *per se* rule that an "ad hoc or temporary" policy resulting in recurring floods can never, "by its very nature," result in a taking. *Id.* That rule is

inconsistent with long-standing precedent of this Court and the Federal Circuit's own precedents.

Amici curiae urge this Court to reverse the Federal Circuit's decision and reaffirm that a physical invasion of private property by the government that directly interferes with the landowner's rights constitutes a physical taking for which just compensation must be paid.

ARGUMENT

I

A PHYSICAL INVASION THAT DEPRIVES A LANDOWNER OF HIS OR HER PROPERTY RIGHTS CONSTITUTES A TAKING REGARDLESS OF ITS DURATION OR METHOD OF INVASION

The term "property" refers to the collection of protected rights inhering in an individual's relationship to his or her land or chattels. *United States v. General Motors Corp.*, 323 U.S. 373, 378 (1945). Among these are the rights to possess, use, exclude others, and dispose of the property. *Id.* A government act that physically interferes with private property in a manner that substantially interferes with one of these rights constitutes a taking for which just compensation is due. *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426, 435 (1982); U.S. Const. amend. V (Private property shall not "be taken for public use, without just compensation.").

This Court's categorical treatment of physical takings follows from the very nature of property rights. The right to exclude others—which is coextensive with the rights of use and possession—is an essential

quality of property. Thus, to the extent the government physically invades or occupies one's land, it destroys all of the essential rights thereto and constitutes a taking. *Loretto*, 458 U.S. at 426, 435 ("'[T]he character of the government action' not only is an important factor in resolving whether the action works a [physical] taking but also is determinative."); *see also Lingle*, 544 U.S. at 539 (A physical invasion will always effect a taking because it eviscerates the owner's right to exclude others from entering upon and using his or her property which is "perhaps the most fundamental of all property interests.").

This rule holds true whether the government's physical interference appropriates a fee simple or an easement for a term of years. *General Motors*, 323 U.S. at 378. Although the owner in the latter instance may still hold *some* valuable rights in the land, those rights are irreparably harmed because they are of a more limited and circumscribed nature than they were before the intrusion. *Id.* The Takings Clause requires just compensation in both circumstances. *Id.*

Cases involving government-induced flooding are no different. When the government causes a river to overflow private property in a manner that directly interferes with the landowner's rights to possess, use, exclude others, or dispose of his or her property, it appropriates a flowage easement over the land and its actions constitute a taking for which compensation is due. *Pumpelly*, 80 U.S. at 181; *United States v. Virginia Elec. & Power Co.*, 365 U.S. 624, 627 (1961). This is true whether or not the flooding is eventually abated. *See, e.g., United States v. Dickinson*, 331 U.S. 745, 750-51 (1947) (flooding for a limited period of years effected a taking); *United States v. Lynah*, 188

U.S. 445, 470 (1903) (flooding resulted in a taking despite the fact that the floods could be abated and land reclaimed). That is because it is the character of the government action—whether it interferes with the owner's rights in the land—that determines whether a taking has occurred. *See, e.g.*, *Causby*, 328 U.S. at 266-68; *Loretto*, 458 U.S. at 426.

A. The Duration of a Physical Invasion Does Not Determine Whether a Taking Has Occurred

Although this Court has, at times, used the terms "permanent" and "temporary" to distinguish those physical intrusions that take an interest in private property from those that do not, *Loretto*, 458 U.S. at 427-28, its case law plainly demonstrates that, for the purpose of determining takings liability, there is no meaningful distinction between a physical invasion that continues in perpetuity and one that is limited in duration.[3] *See, e.g.*, *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304, 318 (1987) ("'[T]emporary' takings . . . are not different in kind from permanent takings, for which the Constitution clearly requires compensation."); *id.* at 331-32 (Stevens, J., dissenting) (The proposition "that there is no distinction between temporary and permanent takings" is well-recognized in the context of physical takings; "the state certainly

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[3] Indeed, even though *Loretto* used the term "permanent" to describe the physical occupation, *i.e.*, installation of a cable box, the statute at issue only required landlords to permit cable companies to install facilities on their properties for a limited and readily determinable period of time. *See Loretto*, 458 U.S. at 421, 439 (The statute provided for a physical occupation for "[s]o long as the property remain[ed] residential and a [cable] company wishe[d] to retain the installation.").

may not occupy an individual's home for a month and then escape compensation by leaving and declaring the occupation 'temporary.'"). Indeed, the test articulated in *Loretto* for determining physical takings relied on several cases in which this Court recognized that even short-term physical invasions or occupations can effect a taking. *Loretto*, 458 U.S. at 430-31, 435 (citing *Pewee Coal*, 341 U.S. 114; *Causby*, 328 U.S. 256; *General Motors*, 323 U.S. 373).

In *Pewee Coal*, the federal government "possessed and operated" the property of a coal mining company for five-and-a-half months in order to prevent a nationwide miners' strike in the middle of World War II. 341 U.S. at 115. The Court unanimously agreed that the government's seizure was a taking, with no regard to the limited duration of the occupation. *Id.* (plurality); *id.* at 119 (Reed, J., concurring); *id.* at 121-22 (Burton, J., dissenting). References to the "temporary" nature of the government's possession were considered only in the context of the amount of compensation due to the plaintiff. *See, e.g., id.* at 117 (plurality). Other wartime seizure cases confirm the principle that short-term occupations can effect a categorical taking. *See Kimball Laundry Co. v. United States*, 338 U.S. 1, 3-4, 7, 16 (1949) (government commandeered laundry plant for less than four years, was required to pay rental value for occupied period of time plus depreciation and value of lost trade routes); *United States v. Petty Motor Co.*, 327 U.S. 372, 374, 380-81 (1946) (government compensated leaseholders for the temporary taking of their leaseholds for period of over two-and-a-half years); *General Motors*, 323 U.S. at 375 (government required to pay short-term rental value for taking portion of a building that had been leased by an

automobile parts company for a period of one year); *Int'l Paper Co. v. United States*, 282 U.S. 399, 407-08 (1931) (government order authorizing a third party to draw the whole of a river's water flow for a period of ten months effected a physical taking of a paper mill's water rights requiring just compensation).

Perhaps the best known temporary invasion case is *Causby*, 328 U.S. 256, where this Court concluded that the noise and glare from military overflights effected a physical taking when they caused a farmer's chickens to panic and die. In that case, the government was issued a one-year lease with an option for annual renewals to use an airport for military purposes. *Id.* at 258-59. The term of the lease was for a total of five years (1942-1947), or until six months after the end of World War II, whichever was earlier. *Id.* Operation of the airport resulted in the frequent overflight of Causby's home and chicken farm. *Id.* at 259. The noise and glare caused by heavy, four-engine bombers, transports, and squads of fighters so interfered with the use and enjoyment of Causby's property and the commercial viability of his farm that this Court held that the government had physically taken an easement for which just compensation was due. *Id.* at 268. The fact that the government's fly-over of Causby's property was of limited duration did not deter this Court from concluding that a compensable taking had occurred. *Id.*

This Court reaffirmed the principles set out in *Causby* and the wartime seizure cases in *First English*, where it surveyed its takings case law to determine that a temporary regulatory policy—just like a temporary physical invasion—can rise to the level of a

taking.[4] 482 U.S. at 316-18. *First English* concluded that the only meaningful difference between a permanent and temporary taking was that a temporary taking puts private property to public use for a limited period of time. *Id.* This distinction, however, does not change the fact that a taking has occurred. *Id.* In such circumstances, the duration of the government interference is only relevant to the question of how much compensation is due. *Id.*; *see also General Motors*, 323 U.S. at 378; *Skip Kirchdorfer, Inc. v. United States*, 6 F.3d 1573, 1582-83 (Fed. Cir. 1993) (duration of a taking is only relevant to the question of how much compensation is due); *Hendler v. United States*, 952 F.2d 1364, 1376 (Fed. Cir. 1991) (duration of a physical invasion is not relevant to the question whether a taking has occurred).

This Court's precedents conclusively establish that the amount of time that the government is present on private property does not determine whether the harm is permanent, and, therefore termination of occupation cannot, as a matter of law, negate the existence of a taking. *See, e.g.*, Professor Steven J. Eagle, *Regulatory Takings* at Ch. 7, § 9(f) (4th ed. 2009) (when the government causes a physical invasion of private property for a limited period of time, it imposes a servitude on the land for the duration of the time it is put to public use, then, when the property is relinquished, the government exercises the appropriated right of alienation in order to return the

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[4] Similarly, in *Lingle* and *Tahoe-Sierra*, this Court cited its temporary physical invasion cases as "paradigmatic" and "categorical" examples of takings for which compensation must be paid. *Lingle*, 544 U.S. at 537 (citing *Pewee Coal*, 341 U.S. 114; *General Motors*, 323 U.S. 373); *Tahoe-Sierra Pres. Council*, 535 U.S. at 322 (citing *Pewee Coal* and *General Motors*)

property in its permanently diminished state to the owner); *see also* John J. Constonis, *Presumptive and Per Se Takings: A Decisional Model for the Taking Issue*, 58 N.Y.U. L. Rev. 465, 543-46 (1983) (surveying this Court's physical takings cases and concluding that temporary physical invasions can constitute a taking); Professor Jan G. Laitos, *The Takings Clause in America's Industrial States After* Lucas, 24 U. Tol. L. Rev. 281, 293 (1993) ("While the Court has distinguished between 'temporary physical invasions' and 'permanent physical occupations,' after [*First English*], even temporary physical invasions may be per se takings, requiring just compensation for the time the property is occupied."). This fact is well-recognized by legal scholars:

> [P]ermanency for doctrinal purposes is not synonymous with permanency in a temporal sense. Rather, it is a label attached to property interference of a sufficiently severe nature. Thus, in developing its [physical] takings doctrine, the Supreme Court has focused on the quality, not the duration of invasion. This was true in early cases and more recent cases. The Court has even viewed interference with limited term leaseholds as a compensable taking. Occassional, periodic, or intermittent occupations can also fall within the rule. In contrast, an isolated, or technical trespass has been viewed as a temporary invasion. Indeed, the Court's latest land use decisions reject any literal distinction between temporary and permanent interferences as

> determinative in either regulatory or [physical] takings cases.

Karl Manheim, *Tenant Eviction Protection and the Takings Clause*, 1989 Wis. L. Rev. 925, 993-94.

> It almost goes without saying that "when the Court speaks in terms of a permanent physical occupation, it does not necessarily mean that the occupation is one which will last forever." [. . .]
>
> The term "permanent" is really the Court's shorthand way of describing which physical occupations, because of the character of the occupation, have a sufficiently severe effect on the property owner such that no public interest can outweigh the impact on the property owner. Thus, no further inquiry into the purpose of the governmental action is necessary. The temporal character of the invasion is a relevant consideration, but not controlling.

Steven Daren Blevit, *A Tale of Two Amendments: Property Rights and Takings in the Context of Environmental Surveillance*, 68 S. Cal. L. Rev. 885, 905-06 (1995) (quoting *Florida Power Corp. v. FCC*, 772 F.2d 1537, 1544 (11th Cir. 1985), *rev'd on other grounds*, 480 U.S. 245 (1987)). The Federal Circuit's conclusion that a physical invasion must continue indefinitely before compensation is due is incorrect and should be reversed.

B. Government-Induced Flooding Is Subject to the Same Substantive Rules as Other Physical Takings

This Court's flooding cases, just like its other physical taking cases, recognize that any invasion of private property can result in a taking, regardless of whether the intrusion is permanent, intermittent, or temporary in duration. All physical takings cases are guided by the principle that when the government uses private property in a manner that inflicts "irreparable and permanent injury *to any extent*," it must compensate the owner. *Pumpelly*, 80 U.S. at 177-78 (emphasis added). In specific regard to flooding, this Court has held that "where real estate is actually invaded by superinduced additions of water, earth, sand, or other material, . . . so as to effectively destroy or impair its usefulness, it is a taking." *Id.* at 181; *see also Lynah*, 188 U.S. at 470 ("Where the government by the construction of a dam or other public works so floods lands belonging to an individual as to substantially destroy their value there is a taking within the scope of the Fifth Amendment."). This test is no different than the test adopted in *Loretto* in that it simply asks whether the government flooding directly caused "a serious interruption to the common and necessary use of property." *Pumpelly*, 80 U.S. at 179; *see also Loretto*, 458 U.S. at 426. If the answer is "yes," then a taking has occurred. *See Cress*, 243 U.S. at 328 ("[I]t is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines the question of whether it is a taking."); *see also* Jeremy Paul, *The Hidden Structure of Takings Law*, 64 S. Cal. L. Rev 1393, 1464 (1991) (flooding that infringes on private

property is a classic example of government action that is appropriative in nature).

This Court has consistently applied this test to find a taking whenever government-caused flooding directly interferes with a landowner's rights in his or her property, regardless of the duration of the intrusion. In *Lynah*, for example, the Court found a that a permanent physical taking occurred when the government placed dams, training walls, and other obstructions in a river in a manner that caused the water level to rise and partially inundate the plaintiffs' land. 188 U.S. at 468. Even though much of the flooding could be prevented and portions of the land reclaimed in the future, the fact remained that the government's actions made the property unfit for its current agricultural uses thereby substantially destroying its value and effecting a taking. *Id.* at 469-70, 474. This Court reiterated that point in *United States v. Welch*, where it explained that, if the government had caused flood waters to enter and destroy private property, then stopped the flooding, its actions would still amount to a taking.[5] 217 U.S. 333, 339 (1910) ("But if it were only destroyed and ended, a destruction for public purposes may as well be a taking as would an appropriation for the same end.").

In *Dickinson*, this Court found that flooding constituted a taking even though the affected land had been reclaimed prior to the takings claim being filed. 331 U.S. at 750-51. In that case, the government constructed a dam as part of a project to improve river

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[5] Two of the wartime seizure cases relied on *Welch* for the rule that the government's temporary occupation and use of private property effected a taking for which compensation is required. *See Petty Motor*, 327 U.S. at 378; *General Motors*, 323 U.S. at 378 n.5.

navigability. *Id.* at 746-47. The dam caused the water level to rise and flood the plaintiffs' land. *Id.* Within five years, the plaintiff had reclaimed most of his land from the flooding. *Id.* at 750-51. *Dickinson* concluded that, by subjecting the property to flooding, the government had exercised dominion over the land and, therefore, appropriated an easement for which just compensation was due. *Id.* at 750. The temporary duration of the government's invasion did not defeat the takings claim. *Dickinson* reasoned that, for the period of time the land was under water, the government had acquired the property: "no use to which Dickinson could subsequently put the property by his reclamation efforts changed the fact that the land was taken when it was taken and an obligation to pay for it then arose." *Id.* at 751.

Shortly after this Court issued its decision in *Pumpelly*, the New Hampshire Supreme Court decided *Eaton v. Boston, Concord & Montreal R.R.*, 51 N.H. 504 (1872), which is notable because the court elaborated on the type of flood-related injury that will give rise to a taking. In *Eaton*, a railroad company, acting pursuant to a state statute, removed a natural flood barrier while constructing tracks, which resulted in the occasional flooding of Eaton's farmland. *Id.* at 507. The railroad argued that the flooding did not rise to the level of a taking because it was temporary and the resulting damages were, therefore, too consequential. *Id.* at 513. The court rejected this argument, noting that the impact was not a "mere personal inconvenience or annoyance" but involved "physical injury to the land itself, a physical interference with property rights, and actual disturbance of the plaintiff's possession." *Id.* The court reasoned that "occasional innundation may produce the same effect

in preventing the plaintiff from making a beneficial use of the land as would be caused by a manual asportation of the constituent materials of the soil." *Id.*; *see also id.* at 512 ("Taking of a part is as much forbidden by the constitution as taking the whole. The difference is only one of degree; the quantum of interest may vary, but the principle is the same.") (internal quotation marks and citation omitted). Thus, the court concluded that "[c]overing the land with water . . . is a serious interruption of plaintiff's right to use it in the ordinary manner" and effected a taking. *Id.* at 513-14 ("To turn a stream of water on to a plaintiff's premises is as marked an infringement of his proprietary rights as it would be for the defendants to go upon the premises in person and dig a ditch, or deposit upon them a mound of earth.") (internal quotation marks and citation omitted). This Court favorably cited *Eaton* in *Lynah*, 188 U.S. at 472; *Gibson v. United States*, 166 U.S. 269, 276 (1897); and *Transportation Co. v. Chicago*, 99 U.S. 635, 642 (1879).

Here, the Court of Federal Claims similarly determined that the Army Corps' water release policies directly resulted in recurring flooding of the Commission's land, which substantially interfered with the Commission's ability to make productive use of its forest lands and permanently destroyed its interest in its valuable timber. Pet. Cert. App. B at 91a-92a. These injuries are not qualitatively different from those suffered in *Causby*, *Lynah*, or *Dickinson* in that they directly and irreparably impacted the Commission's right to the customary and valuable use of its property. And they are a far cry from the type of minor intrusions or nominal harm that are only recoverable, if at all, in a tort claim. *See Loretto*, 458 U.S. at 428-29 (Explaining that the Takings Clause

does not provide compensation for minor and passing intrusions like an "ordinary traveller [sic], whether on foot or in a vehicle, pass[ing] to and fro along the streets, and his use and occupation therefore are temporary and shifting. The space he occupies one moment he abandons the next to be occupied by another traveller.") (quoting *St. Louis v. Western Union Tel. Co.*, 148 U.S. 92, 98-99 (1893)); *see also Eaton*, 51 N.H. at 525-26 (the type of temporary intrusion that will not give rise to a taking is one where there is only a "temporary trespass," such as a person crossing a lawn or an engineer surveying the land, resulting only in nominal damages such that the land is not subjected to a servitude and the beneficial possession of the owner is not substantially interfered with). The Federal Circuit's conclusion that government-caused flooding can never give rise to a taking if it is limited in its temporal duration is incorrect and should be reversed.

II

THE "CHARACTER OF THE INVASION"—NOT THE GOVERNMENT'S INTENT—WILL DETERMINE A TAKING

The key question posed by this case is how a court evaluates a temporary physical invasion claim. The decisions discussed above hold that the "character of the invasion" will be determinative of whether a taking has occurred. *Causby*, 328 U.S. at 266; *Loretto*, 458 U.S. at 426. In other words, when a landowner alleges a physical taking, the court must determine whether the government caused a physical invasion of private property that interfered with the owner's rights to use, possess, exclude others, or dispose of the property. *See Causby*, 328 U.S. at 266-68; *Lynah*, 188 U.S. at 470. In

its decision below, however, the Federal Circuit concluded that the Army Corps' intent that its water release policies be "ad hoc or temporary" was determinative of the Commission's taking claim without considering the trial court's findings that the flooding: (1) was readily foreseeable (Pet. Cert. App. B at 94a-99a); (2) directly interfered with the Commission's use of its land (Pet. Cert. App. B at 91a-92a, 100a-102a, 104a-128a); and (3) destroyed millions of dollars worth of valuable hardwood timber (Pet. Cert. App. B at 91a-92a, 140a-142a):

> [I]n determining whether a governmental decision to release water from a dam can result in a taking, we must distinguish between action which is by its nature temporary and that which is permanent. But in distinguishing between temporary and permanent action, we do not focus on a structure and its consequence. *Rather we must focus on whether the government flood control policy was a permanent or temporary policy.* Releases that are ad hoc or temporary cannot, by their very nature, be inevitably recurring [and therefore cannot constitute a taking].

Pet. Cert. App. A at 23a (emphasis added). The Federal Circuit's conclusion that the government's intent will determine a taking finds no support in this Court's case law and should be reversed.

A. The "Character of the Invasion" Test Is Sufficient to Take the Duration of the Government Invasion Into Consideration

In a flooding case, just like any other physical taking cases, it is the character of the government act that determines whether the invasion constitutes a taking. *Cress*, 243 U.S. at 328; *Causby*, 328 U.S. at 266; *Loretto*, 458 U.S. at 426. This inquiry allows the court to consider the actual impact that temporary flooding has on the property owner's rights in order to determine the extent to which the invasion constitutes an exercise of dominion over the land and therefore a taking. Take, for example, the consolidated cases decided in *Cress*, 243 U.S. 316: in that case, the federal government's construction and maintenance of locks and dams on the Kentucky and Cumberland Rivers caused the rivers and their tributaries to back up and intermittently overflow a portion of one plaintiff's property and interfere with another plaintiff's operation of a mill. 243 U.S. at 318-19, 327. The Court found that the periodic intrusions appropriated an easement because, during periods of overflow, the government's actions directly and substantially interfered with each landowner's rights to make valuable use of his property. *Id.* at 329-30. The Court concluded that, although intermittent, the "character of the invasion" was a physical intrusion that directly interfered with the landowner's rights to possess, use, exclude others, or dispose of his property. *Id.* at 328, 330. The only substantive difference that the Court found between permanent and temporary flooding is that, in the latter circumstance, the landowner may retain possession of his land and the government is obligated to compensate the owner for

the value of the easement taken. *Id.* at 329 ("If any substantial enjoyment of the land still remains to the owner, it may be treated as a partial, instead of a total, devastating of his property in the land. The taking by condemnation of an interest less than the fee is familiar in the law of eminent domain.").

By contrast, in *Sanguinetti v. United States*, this Court applied the "character of the invasion" test to find no taking where the landowner was unable to show that increased flooding interfered with his use of his land. 264 U.S. 146, 150 (1924). In that case, the government constructed a diversion canal intended to protect downstream properties from seasonal flooding. Sanguinetti's land, nonetheless, was repeatedly inundated during a period of record-setting rains and flooding. Sanguinetti sued claiming that the canal project effected a taking by exposing his land to increased flooding. Distinguishing *Cress*, the *Sanguinetti* Court explained that "in order to create an enforceable liability against the government, it is at least necessary that the overflow be the direct result of the structure, and constitute an actual, permanent invasion of the land, amounting to an appropriation of and not merely an injury to the property." *Id.* Sanguinetti, however, failed to show that the canal project caused increased flooding on his property or that his land was "overflowed for such a length of time in any year as to prevent its use for agricultural purposes."[6] *Id.* at 147, 149. As a result, the Court determined that there was no "permanent impairment

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[6] *See also Bedford v. United States*, 192 U.S. 217, 225 (1904) (holding that no taking occurred when landowner was unable to prove that flooding was the direct result of a government project upstream).

of value" and no appropriation of Sanguinetti's land. *Id.* at 149.

The "character of the invasion" test effectively distinguishes takings from nontakings in other contexts as well. *See, e.g., Causby*, 328 U.S. at 266-68; *Loretto*, 458 U.S. at 426. Over the years, the lower courts have developed a test for determining the "character of the invasion" in physical takings cases. The test requires the court to consider the nature of the government's action and other relevant information to determine (1) whether the government intended to invade a protected property interest *or* whether the asserted invasion was the direct, natural, or probable result of government activity (this first prong is disjunctive), and (2) whether the interference was substantial enough to rise to the level of a taking.[7] *See, e.g., Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1356 (Fed. Cir. 2003). This test has been applied to a wide range of claims alleging a physical invasion taking.[8] But, most importantly, the lower courts, including the trial court in this case, have applied this test to find that flooding of a limited duration effected a taking. *See* Pet. Cert. App. B at 81a-86a (analysis of property interest at issue); *id.* at 86a-104a (analysis of

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[7] For an exhaustive history of this test, see *Hansen v. United States*, 65 Fed. Cl. 76, 95-119 (2005).

[8] *See, e.g., Cary v. United States*, 552 F.3d 1373, 1376-77 (Fed. Cir. 2009) (fire suppression policies); *Moden v. United States*, 404 F.3d 1335, 1342 (Fed. Cir. 2005) (exposing property to chemical contaminant); *Placer Mining Co. v. United States*, 98 Fed. Cl. 681, 687-88 (2011) (channel construction that caused mine entrance to collapse); *Kam-Almaz v. United States*, 96 Fed. Cl. 84, 89 (2011) (seizure of laptop computer); *Banks v. United States*, 88 Fed. Cl. 665, 685-86 (2009) (erosion caused by government project).

the character of the invasion); *id.* at 104a-128a (analysis of causation); *see also Ridge Line*, 346 F.3d at 1354-55 (reversing and remanding dismissal of flood invasion takings claim even though the landowner made improvement to his property that abated the flooding); *Cooper v. United States*, 827 F.2d 762, 763-64 (Fed. Cir. 1987) (finding a taking even though the U.S. Army Corps of Engineers remedied the flooding after five years). When applied properly, this test follows this Court's direction that the "character of the invasion" be determinative of whether a taking has occurred.

The decision below radically departs from this Court's precedents by elevating the government's intent to the sole determinative factor in a takings case. Pet. Cert. App. A at 23a, 27a. As a result, the Federal Circuit concluded that it was not required to consider the impact that the government-caused flooding had on the Commission's rights in its land. *Id.* at 22a-23a. Without evaluating the extent to which the Army Corps' flooding impacted the Commission's rights to use, possess, exclude others, or dispose of its property, however, it was impossible for the Federal Circuit to determine whether or not a taking occurred—which is another reason why its decision should be reversed.

B. The Government's Intent Is Irrelevant Where the "Character of the Invasion" Is a Taking

There is simply no basis in this Court's modern takings law[9] to require a plaintiff to prove that the government acted with an appropriative intent when it physically invades or occupies private property. *See* Alan Romero, *Takings by Floodwaters*, 76 N.D. L. Rev. 785, 815 (2000) ("When the government causes water to invade private land, the government's inanimate agent physically enters and occupies the land . . . . It makes no difference that . . . the government might not have intended to take the land."). In such circumstances, the government's liability exists without regard to the reason for the invasion or the circumstances under which the property was acquired. *See Loretto*, 458 U.S. at 426 (public purpose irrelevant); *Tahoe-Sierra*, 535 U.S. at 323) (same); *see also*

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[9] Some early takings cases (*e.g.*, *Portsmouth Harbor Land & Hotel Co. v. United States*, 260 U.S. 327 (1922)) discuss the government's intent as a basis for finding takings liability. These cases, however, arise from a period of time when the Court of Claims lacked the authority to consider direct constitutional claims. *Hansen*, 65 Fed. Cl. at 106 n.41 (citing Act of February 24, 1855, ch. 122, 10 Stat. 612 (1855)). As a result, the court considered takings claims as claims for assumpsit based on a breach of implied contract theory. *See id.* at 107 (citing cases). A plaintiff asserting a claim under implied contract theory argued that the Takings Clause constituted a governmental promise to compensate property owners for damage to his or her private property. *See id.* at 107-08. Thus, the early takings cases from this period extended the takings inquiry to consider intent as a distinguishing characteristic of compensable takings under an implied contract theory. *See Klebe v. United States*, 263 U.S. 188, 191-92 (1923); *United States v. N. Am. Transp. & Trading Co.*, 253 U.S. 330, 333-34 (1920); *Tempel v. United States*, 248 U.S. 121, 130-31 (1918).

Preseault v. United States, 100 F.3d 1525, 1537 (Fed. Cir. 1996) (expectations not considered in physical invasion case); *see also Hansen v. United States*, 65 Fed. Cl. 76, 81 (2005) (The Takings Clause "contains no state of mind requirement.").

According to the Federal Circuit, however, its evaluation of the Army Corps' intent was necessary to determine, as a threshold matter, whether the Commission's lawsuit alleges harm that is recoverable under a tort theory. Pet. Cert. App. A at 23a, 27a. The Federal Circuit held that this determination would prove dispositive of a takings claim, obviating the need to evaluate the character of the invasion, because, according to the lower court, harm recoverable under a tort theory can never be recovered under the Takings Clause. *Id.* at 22a-23a, 27a. In reality, this analysis is of little value because every government act that involves an invasion or destruction of property is, by definition, tortious. *See, e.g., City of Monterey v. Del Monte Dunes at Monterey, Ltd.*, 526 U.S. 687, 715 (1999) (A taking claim is analogous to a tort in that it alleges an interference with property interest.); *Richards v. Washington Terminal Co.*, 233 U.S. 546, 551 (1914) ("[I]t is sufficiently obvious that the acts done by defendant, if done without legislative sanction, would form the subject of an action by plaintiff to recover damages as for a private nuisance."); *Pumpelly*, 80 U.S. at 166, 176-77 (a flood invasion is analogous to a claim for trespass on the case).[10] Consequently, the

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[10] *See also Palm v. United States*, 835 F. Supp. 512, 516 (N.D. Cal. 1993) (The "cluster of facts that constitute a claim for an unconstitutional taking and those that indicate the torts of nuisance or trespass are similar in many respects. Both situations involve situations of unlawful entry onto an owner's property or

(continued...)

identification of a possible tort, standing alone, is an insufficient basis upon which to conclude whether or not a taking occurred. *See Dickinson*, 331 U.S. at 750 (holding that the government had to compensate the owner for the value of the easement taken as well as for all consequential damages occurring during floods). As discussed above, the court must still determine whether the government invasion directly and substantially impacted the owner's rights, which is the sole determinative inquiry in a physical takings case. *Causby*, 328 U.S. at 266-68; *Cress*, 243 U.S. at 328.

The Federal Circuit's adoption of a threshold test that operates to circumvent any meaningful analysis of the merits of a takings plaintiff's case conflicts with the purpose of the Takings Clause. The Takings Clause is designed "to preserve practical and substantial rights" that individuals have in their property. *Dickinson*, 331 U.S. at 748-49. That purpose is not served when the lower courts develop procedures designed to dispose of otherwise meritorious takings claims. *Id.* (noting the danger of dismissing a legitimate takings claim based on the "shifting meanings" derived from tort theories); *see also Boyd v. United States*, 116 U.S. 616, 635 (1885) ("Illegitimate and unconstitutional practices get their first footing . . . by silent approaches and slight deviations from legal modes of procedure. This can only be obviated by adhering to the rule that constitutional provisions for the security of person and property should be liberally construed."); *Eaton*, 51

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[10] (...continued)
infringement of an owner's right to use and enjoyment of her property."); *Clark v. United States*, 19 Cl. Ct. 220, 222-23 (1990) ("There is no analytical inconsistency between tort and takings theories. Both a tort and taking can be made out of the same set of operative facts.").

N.H. at 520-21 ("We are not to suppose that the framers of the constitution meant to entangle their meaning in the mazes of the refined and technical distinctions by which the common law system of forms of action is perplexed and incumbered.").

Given the diverse circumstances under which a taking can occur, it is impossible to draw a bright line rule stating that a physical invasion can never effect a taking if the harm resulting from it could theoretically be recovered in a tort action. *Dickinson*, 331 U.S. at 749. Such a rule would be over broad and would result in meritorious claims being dismissed. Indeed, by drawing such a line in this case, the Federal Circuit left the Commission in the untenable position of having to suffer repeated flood invasions and significant injuries to its land and property without any means to recover for any of the harm inflicted by the government acts because the Army Corps enjoys immunity from tort claims arising from its water release policies under the Flood Control Act of 1928, 33 U.S.C. § 702c. This Court should reject the Federal Circuit's adoption of an intent-based threshold test for a physical takings claim.

C. There Is No Need to Develop an Ad Hoc Balancing Test for Physical Invasions of Limited Duration

Given the demonstrated flexibility and functionality of the "character of the invasion" test, there is no need for this Court to develop a "more complex balancing test" for temporary physical invasion cases. *See Loretto*, 458 U.S. at 435 n.12. Indeed, none of the parties has suggested such a test.

Nonetheless, this Court could, in its decision here, resolve confusion arising from its discussion of flooding cases in *Loretto*. 458 U.S. at 428, 435 n.12. *Loretto* generally summarized this Court's flooding cases as follows: "this Court has consistently distinguished between flooding cases involving permanent physical occupation, on the one hand, and cases involving a more temporary invasion [. . .] on the other. A taking has always been found only in the former situation." *Id.* at 428 (internal citations omitted). Then, in a footnote discussing the viability of temporary physical taking claims, the Court noted that it had subjected its interim flooding cases (presumably, *Cress*, 243 U.S. 316, and *Sanguinetti*, 264 U.S. 146) to "a more complex balancing test." *Loretto*, 458 U.S. at 435 n.12.

Some commentators suggest that footnote 12 may stand for the proposition that temporary physical invasions are to be adjudicated under the multi-factorial, ad hoc test developed in *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (1978).[11] That suggestion, however, was put to rest in *Tahoe-Sierra*, where this Court explained that *Penn Central* does not apply to a physical taking case. *Tahoe-Sierra*, 535 U.S. at 322-23 ("This longstanding distinction between acquisitions of property for public use, on the one hand, and regulations prohibiting private uses, on the other, makes it inappropriate to

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[11] *See, e.g.*, Robert Meltz, *Takings Law Today: A Primer for the Perplexed*, 34 Ecology L.Q. 307, 362-63 (2007); Marcus J. Lock, *Braving the Waters of Supreme Court Takings Jurisprudence: Will the Fifth Amendment Protect Western Water Rights From Federal Regulation?*, 4 U. Denv. Water L. Rev. 76, 90 (2000); Dennis H. Long, *Note: The Expanding Importance of Temporary Physical Takings: Some Unresolved Issues and an Opportunity for New Directions in Takings Law*, 72 Ind. L.J. 1185, 1194 (1997).

treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a 'regulatory taking' and vice versa."); *see also id.* at 323 ("we do not ask whether a physical appropriation advances a substantial government interest or whether it deprives the owner of all economically viable use").

Nor is there any basis in this Court's flooding cases to develop a different test for temporary flooding. Indeed, *Dickinson*, *Welch*, and *Lynah* demonstrate that this Court has found a taking where the duration of the flood was finite, and, therefore the invasion itself is a temporary condition. *Dickinson*, 331 U.S. at 750-51; *Welch*, 217 U.S. at 339; *Lynah*, 188 U.S. at 469-70, 474. Moreover, *Cress* did not involve a balancing test; it established the rule that the "character of the invasion" is determinative of a physical taking case. 243 U.S. at 328; *see also Sanguinetti*, 264 U.S. at 147-49 (applying the *Cress* "character of invasion" test). And this Court relied on the rules and principles developed in its flooding cases to hold that the temporary physical invasions at issue in the wartime seizure cases and *Causby* effected takings. *See Petty Motor*, 327 U.S. at 378 (citing *Welch*, 217 U.S. 333, for the rule that the government's temporary occupation and use of private property effected a taking for which compensation is required); *General Motors*, 323 U.S. at 378 n.5 (same); *Causby*, 328 U.S. at 261 n.6, 266 (citing *Dickinson*, 331 U.S. 745; *Cress*, 243 U.S. 316; *Welch*, 217 U.S. 333; *Lynah*, 188 U.S. 445; *Pumpelly*, 80 U.S. 166). Indeed, the principles established by this

Court's flooding cases are so universal that they supplied the basis for this Court to recognize the viability of a claim for a temporary regulatory taking. *First English*, 482 U.S. at 316-18 (relying on *Pumpelly*, 80 U.S. at 177-78).

There is no reason, therefore, to treat temporary flooding differently than other physical invasions; both are subject to the same test recognized in *Loretto* and *Causby*.

CONCLUSION

The Federal Circuit's rule—which removes all temporary flood invasions resulting from ad hoc or temporary government policies from the protections of the Takings Clause—is unnecessary and over broad. For nearly a century, this Court has held that the "character of the invasion" will determine when a temporary invasion rises to the level of a taking. There is no reason to depart from this rule. This Court should reverse the Federal Circuit's decision and reaffirm the principle that the government's physical invasion of private property constitutes a physical taking requiring just compensation when it directly

interferes with the landowner's rights to possess, use, exclude others, or dispose of his or her property.

DATED: July, 2012.

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AMICUS CURIAE BRIEF

No. 11-597

In The
Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,

Petitioner,

vs.

UNITED STATES OF AMERICA,

Respondent.

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

MOTION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF OF PROFESSORS OF LAW TEACHING IN THE PROPERTY LAW AND WATER RIGHTS FIELDS AND BRIEF *AMICUS CURIAE* IN SUPPORT OF RESPONDENT

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MOTION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF OF PROFESSORS OF LAW TEACHING IN THE PROPERTY LAW AND WATER RIGHTS FIELDS

Amici, full-time professors Robert Abrams, Zygmunt Plater, and Noah Hall, file this motion pursuant to Rule 37 seeking leave to file a brief *amicus curiae* in the above-captioned case.

1. The *Amicus* Brief filed with the Court on Thursday, August 30, 2012, as described below, was filed without consent of both parties and is hereby withdrawn pending the outcome of this motion for leave to file the brief in question.

2. The *amici* filed their brief in this case by third-party carrier and filing it electronically with the Court on Thursday, August 30, 2012. The electronic certificate of service sent by counsel erroneously stated that the brief was being filed with the consent of the parties. The undersigned counsel was under the misimpression that the parties had granted blanket consents to the filing of *amicus* briefs, but that is not in fact the case. While the United States has granted its blanket consent to the filing of *amicus* briefs, the petitioner has not granted a blanket consent and has declined to grant its consent to the filing of this brief.

3. *Amici* are professors of water law and property law who bring substantial expertise and experience related to the issues of state water law that are implicated by this important case. *Amici* believe that

their brief, which addresses in detail issues not addressed either by the United States or any other *amicus* party, will be of considerable help to the Court in resolving this case.

WHEREFORE, the *amici* request that the Court grant this motion.

Respectfully submitted,

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INTEREST OF *AMICI CURIAE*[1]

Amici are full-time law professors who teach and write about water law, environmental law and/or property law. A complete list of the individual *amici* is attached as Appendix A. *Amici* submit this brief to explain the broader context of Arkansas water law that gives definition to the state-law property interests claimed to have been taken without compensation by the Respondent. *Amici* hope that this brief will aid the Court by providing an accurate assessment of Arkansas water law as it defines the property rights that underlie this case.

SUMMARY OF ARGUMENT

In cases asserting a taking of property without just compensation, the property right claimed to be taken is generally defined by state law. In this case, the property interest allegedly taken is an interest in land (and timber) the nature and scope of which are defined by Arkansas law governing ownership of riparian lands. Understanding the nature and content of the claimed state law property interest is a foundational element in the taking of property analysis. In the case at bar, for there to be a taking of

[1] The Petitioner has not consented to the filing of this brief. No counsel for any party authored this brief in whole or in part, and no person or entity, other than *amici* and their counsel, made a monetary contribution to the preparation or submission of this brief.

property, Petitioner must be able to justifiably claim that the government action has intruded upon a protected property entitlement under state law. Neither of the courts below considered the nature and scope of Petitioner's claimed property interest as established by Arkansas law. Thus, if the takings issue cannot be resolved in favor of Respondent on independent takings law grounds such as those framed in the opinion below, the decision must include consideration of Arkansas state law to determine if the Petitioner can justifiably claim an interference with a vested entitlement. In addition, even if the qualified nature of Petitioner's property interests does not bar the claim at the threshold, the nature and scope of Petitioner's property interest are relevant to the potential issue in this case of whether and to what degree there may have been an interference with Petitioner's reasonable investment-backed expectations. This brief addresses only the content of Arkansas state law as it gives definition to Petitioner's claimed property right.

The doctrines and precedents that comprise Arkansas' state law potentially applicable to this case make clear that the Arkansas Supreme Court, in evaluating Petitioner's claimed state law property entitlement, would apply reasonable use riparianism. Under that doctrine as articulated by the Arkansas Supreme Court, the rights of all riparians are correlative, and an Arkansas court is thus required to consider the larger context of the stream and the public interest in discerning the extent of each owner's interest.

Arkansas common law on the subject throughout the 20th century and to the present takes a pragmatic view of the determination of what is reasonable and considers a variety of factors in deciding cases of claimed interference with riparian rights, including cases involving claimed interference with flow that affects water levels. To perform that analysis Arkansas courts use a multi-factor balancing test. Applying such a test is heavily fact-dependent and is particularly challenging because Arkansas law does not assign weights to the factors in the test nor do the cases on point explicitly invoke and link the important facts to the test factors. Even so, Arkansas law provides several points of clarity relevant to the case at bar. First, downstream inundation injuries may be found unreasonable, but are not *per se* unreasonable intrusions on the interest of the downstream riparian. Second, seasonal interference with a co-riparian's enjoyment of an important aspect of riparian proprietorship is not, standing alone, an unreasonable interference with riparian rights. Third, considering the factors applied to determine when a riparian use is unreasonable, the flood prevention benefits for the broader community created by Respondent's decisions to temporarily change the operating parameters of the Clearwater Dam would be considered by an Arkansas court as a factor (among others) to be weighed against the adverse impacts allegedly inflicted on Petitioner's property.

Under Arkansas precedents, an Arkansas court would conclude that Petitioner does not have an

unqualified legal right to be free of interference by a co-riparian in its enjoyment of riparian rights. Rather the protected property expectations of all riparians are twice limited; the degree of interference must exceed mere annoyance or inconvenience, and even if that threshold is crossed, interference may be justified under the multi-factor balancing test of *Harris v. Brooks*, 225 Ark. 436, 283 S.W.2d 129 (1955). The factors listed as bearing on the determination of whether a challenged use is reasonable include (1) the nature of the use, (2) its extent, duration, necessity, and application, (3) the nature and size of the stream, (4) the several uses to which the stream is put, (5) the extent of the injury to one proprietor and the benefit to the other, and (6) all other facts which may bear upon the reasonableness of the use.

Arkansas precedents since *Harris* do not include any cases on all fours with the case at bar, as there is no case in which there are both substantial interference with the expectations of the adversely affected riparian as well as significant and broad benefits being generated by the riparian alleged to be causing the interference. The available precedents have relied heavily on the weighing of comparative benefits factor in assessing reasonableness. In the cases to date, that factor has been so one-sided that the post-*Harris* cases were easy to decide with little discussion that went beyond the comparative values at stake. The extent, duration, and necessity factor, referring to the need for the party causing the interference to act, and the particular form of action taken, also has been at work in the cases.

Without more comprehensive guidance from the precedents, the analysis in the present case should stress those same two factors, the balance of benefits and harms, and the necessity of the action taken. That analysis also would consider the use itself – federally financed flood control that is by design intended to provide broad benefits to property owners and others. Using those factors, the actions of the United States Army Corps of Engineers ("Corps"), though they may have caused a substantial interference with Petitioner's flood plain lands, would not be unreasonable. Respondent's actions were calculated to produce a set of public safety and other economically valuable benefits to the agricultural community and others that in total almost certainly far outweigh the loss suffered by Petitioner. The harm was not intentional; Respondent initially was unaware of the potential damage to Petitioner posed by its revised operating plan. Perhaps most tellingly under the *Harris* factors, Respondent was in a position where operating the dam, whether pursuant to the old plan or the changed plan, was "necessary." The change to the revised operating plan was an effort to achieve maximum beneficial use for all co-riparians. Under the *Harris* factors, it is difficult to conclude the Corps' behavior is an unreasonable riparian use, or, correlatively, that Petitioner could justifiably expect it would not be subject to such interference.

Looking at the problem in a different light, beginning from the *Harris* factors concerning the nature of the riparian environment, it is difficult to credit as a

justified expectation that land in a flood plain of a flood-prone river will remain sufficiently free of inundation to guarantee its maintenance as a source of hardwood timber production. For a period of years the actions of the Corps benefitted Petitioner, but there is no valid expectation that the Corps' operating plan was immutable. If anything, the law of reasonable use riparianism suggests that all riparians are at risk that the mix of uses will change to their detriment. A riparian's expectation of continued benefits is enjoyed subject to the possibility that the evolving and changing mix of reasonable uses made of the shared water resource may substantially alter their riparian enjoyment and use.

ARGUMENT

This brief addresses solely issues of Arkansas state property law that form a backdrop upon which the Fifth Amendment takings claim must rest. Petitioner Arkansas Game and Fish Commission's ("AGFC") property interests in this case arise pursuant to Arkansas state law. Petitioner must therefore be able to demonstrate that the conduct of Respondent in this case would interfere with a vested entitlement supported by Arkansas property law. *See, e.g., Phillips v. Wash. Legal Found.*, 524 U.S. 156 (1998) (applying state law to define the nature and extent of property interests for the purposes of takings of property claims).

No inquiry into the state law property interest of Petitioner has been undertaken. The Court of Claims appears to have assumed that Respondent's conduct interfered with Petitioner's vested property interests without a review of Arkansas law. Similarly, the Federal Circuit reversed without making that inquiry. Neither opinion discusses the content of Arkansas property law as it relates to the riparian property of Petitioner, and neither opinion cites even a single Arkansas case on the subject. Even the Petitioner cites no state law authorities whatsoever. *See* Petitioner's Brief on the Merits at *iv-viii, *Arkansas Game and Fish Comm'n v. United States*, No. 11-597 (U.S. June 27, 2012).

In contrast, this brief makes no inquiry into and takes no position on the issues of takings law, such as the argument that the temporary nature of the inundation cannot amount to a taking of property. Assuming, *arguendo* that this Court does not rule on this case in a manner that pretermits resolution of the nature of Petitioner's state law property interests, the remainder of this brief will describe the nature of Arkansas state law as it defines those rights.

I. ARKANSAS FOLLOWS THE DOCTRINE OF REASONABLE USE RIPARIANISM USING A MULTI-FACTOR BALANCING TEST TO MEASURE WHEN A LEGITIMATE RIPARIAN USE UNREASONABLY INTERFERES WITH THE RIGHTS OF CO-RIPARIANS

Arkansas has a long history of applying a pragmatic version of the doctrine of reasonable use riparianism as its water law. For example, almost a full century ago in the case of *Barboro v. Boyle*, 178 S.W. 378 (Ark. 1915), the Arkansas Supreme Court envisioned the possibility that future competition for the use of water would require adaptation of its water law to recognize and facilitate the state's interest in supporting changed patterns of water use, such as increased irrigation, more dense settlement, or recreation. *Id.* at 380. *See, e.g.*, *Harris v. Brooks*, 283 S.W.2d 129 (Ark. 1955) (addressing irrigation in competition with recreational boating); *Jones v. Oz-Ark-Val Poultry Co.*, 306 S.W.2d 111 (Ark. 1957) (extending reasonable use test to groundwater); *Scott v. Slaughter*, 373 S.W.2d 577 (Ark. 1963) (balancing water-based commercial hunting and fishing use).

The leading statement of Arkansas' reasonable use riparianism appears in the case of *Harris v. Brooks*, 283 S.W.2d 129 (Ark. 1955). In that case the court reviewed a dispute between two riparians on a small lake, one making an irrigation use and the other a commercial recreational fishing and boating use. The court stated a series of rules of decision that governed types of water use conflict and placed the irrigation-recreation conflict posed in *Harris* into a

category of cases in which state law provided no preference of use,[2] as follows:

> When one lawful use of water interferes with or detracts from another lawful use, then a question arises as to whether, under all the facts and circumstances of that particular case, the interfering use shall be declared unreasonable and as such enjoined, or whether a reasonable and equitable adjustment should be made, having due regard to the reasonable rights of each.

Id. at 134. Further, with such competing riparian uses in the setting of *Harris*, the court added a footnote as follows:

> 56 Am.Jur. page 783 it is stated: 'In determining whether an artificial use of the water of a stream is reasonable or not, it is necessary to consider [1] what the use is for, [2] its extent, duration, necessity, and application, [3] the nature and size of the stream, and [4] the several uses to which it is put, [5] the extent of the injury to one proprietor and the benefit to the other, and [6] all other facts which may bear upon the reasonableness of the use.'

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[2] An example of a preference in law is the preference for domestic use of water which, under Arkansas law set out in an omitted passage from *Harris*, is not subject to being balanced against less preferred uses. *See Harris v. Brooks*, 283 S.W.2d at 134, n. 4.

Id. (Internal numbering supplied.) Subsequent Arkansas cases have uniformly adopted the *Harris* statement of Arkansas law and the factors listed in the quoted footnote as controlling and thereafter applied the test in reaching a decision. *See, e.g., Crum v. Craig*, 2010 Ark. App. 531, ___ S.W.3d ___, 2010 WL 2517610 at *10-*11 (2010); *Nilsson v. Latimer*, 664 S.W.2d 447, 450 (Ark. 1984); *Scott v. Slaughter*, 373 S.W.2d 577, 579 (Ark. 1963). Also, *cf.*, J. W. Looney, *An Update on Arkansas Water Law: Is the Riparian Rights Doctrine Dead?* 43 ARK. L. REV. 573, 576 (1990) (accepting *Harris* as the governing law and noting the increased use of regulatory allocation of surface water to ensure efficiency in allocating use of short water supplies).[3]

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[3] There is a variant line of cases that conflates the principles of riparianism in dealing with "floodwater" in a watercourse with the doctrines and principles applicable to diffuse surface water drainage, which involves the actions a landowner may take to repel water that is not yet part of a watercourse. *See generally*, J. W. Looney, *Diffused Surface Water in Arkansas: Is It Time For A New Rule*, 18 U. ARK. LITTLE ROCK L. REV. 393, 410-412 (1996). As to diffuse surface water drainage cases, Arkansas follows the "modified common enemy doctrine" which allows an upper owner freedom to defend his parcel from the water so long as the owner taking the action does so "in good faith" and "with no purpose of abridging or interfering with any of their neighbor's rights." *Little Rock & Fort Smith Ry. Co. v. Chapman*, 39 Ark. 463, 480 (1882). Under the *Chapman* rule, Petitioner could claim to protected entitlement to be free of damage to its property from floodwater so long as the Respondent acted in good faith and without the purpose of injuring Petitioner.

The *Harris* test of when a riparian use that causes interference with uses of a co-riparian crosses the line between reasonable and unreasonable is very open-ended. The *Harris* court acknowledged the open-ended character of the test itself when it commented, "It is obvious that there are no definite guide posts provided and that necessarily much must be left to judgment and discretion." *Harris*, 283 S.W.2d at 135. The catch-all language at the end of the footnote referencing Am. Jur. which includes the phrase, "all other facts which may bear on the reasonableness of the use," opens the door to an exceedingly broad inquiry. In *Harris*, the Arkansas Supreme Court supplied a degree of guidance regarding how the determination is to be made with its reliance on Restatement (First) of the Law, Torts, §852(c) (1939). The court states:

> The breadth and boundaries of this area of discretion are well stated in Restatement [First] of the Law, Torts, §852c in these words: 'The determination in a particular case of the unreasonableness of a particular use is not and should not be an unreasoned, intuitive conclusion on the part of the court or jury. It is rather an evaluating of the conflicting interests of each of the contestants before the court in accordance with the standards of society, and a weighing of those, one against the other. *The law accords equal protection to the interests of all the riparian proprietors in the use of water, and seeks to promote the greatest beneficial use of the water, and seeks to promote the greatest*

> *beneficial use by each with a minimum of harm to others.* But when one riparian proprietor's use of the water harmfully invades another's interest in its use, there is an incompatibility of interest between the two parties to a greater or lesser extent depending on the extent of the invasion, and there is immediately a question whether such a use is legally permissible. *It is axiomatic in the law that individuals in society must put up with a reasonable amount of annoyance and inconvenience resulting from the otherwise lawful activities of their neighbors in the use of their land. Hence it is only when one riparian proprietor's use of the water is unreasonable that another who is harmed by it can complain, even though the harm is intentional.* Substantial intentional harm to another cannot be justified as reasonable unless the legal merit or utility of the activity which produces it outweighs the legal seriousness or gravity of the harm.'

Id. (Emphasis added.) Using the Restatement passage as an initial frame to apply Arkansas law to the facts of this case is helpful, but may not be sufficient to end the inquiry. The actions of the Corps in this case, if they are sufficiently proven to have caused the increased inundation which in turn destroyed the hardwoods as claimed by Petitioner, exceed mere annoyance or inconvenience. Equally, however, Arkansas law requires that even if Respondent's actions are properly characterized as intentional, and the impact is substantial, those actions may still be considered

legally reasonable based on the "legal merit or utility." *Id.* at 135.

Both legal merit and utility are demonstrably present here. Legally, Respondent is charged by Congress with mitigating potential flood effects in the Black River basin from the Missouri dam site to distant downstream points in Arkansas.[4] In that role, the Corps' adoption of a series of operational deviations unfolds as a good faith choice about how best to distribute potential flood waters in time and space. Its operations are planned so as to benefit the entire spectrum of downstream co-riparians by limiting harm to life and property and maximizing beneficial use of the water and the riparian corridor.[5]

What that initial inquiry does not reveal is whether the operational choices made by the Corps can be found to unreasonably interfere with the justifiable expectations of a downstream riparian owning lands in the Black River flood plain. The teaching of *Harris*, a case set on a small lake posing conflict between irrigation use and boating use that was the

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[4] The authorization of the Clearwater Dam and its intent to reduce flooding of agricultural lands were noted by the Court of Claims. *See Arkansas Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 602 (Ct. Cl. 2009).

[5] Under the Corps' Water Control Manual, consideration is given to "flood potential, lake and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes." *Arkansas Game & Fish Comm'n v. United States*, 637 F.3d 1366, 1368 (Fed. Cir. 2011).

mainstay of a small hunting and sport fishing business, is that the reasonableness of Respondent's actions should be judged with reference to the six factors made pivotal by Arkansas law. What *Harris* does not do, is offer very much to illuminate how the factors would be weighted on a larger watercourse where an alleged unreasonable activity has multiple impacts, rather than presenting a stark choice between incompatible uses. A review of Arkansas case law follows to identify the relative importance of the factors in determining what Arkansas courts would deem reasonable. It suggests that Petitioner has not met the burden of demonstrating that what the Corps has done is unreasonable under the circumstances and has not identified a vested property interest that would support its takings claim.[6]

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[6] If the Court were to reverse the ruling of the Federal Circuit and refuse to accept the argument presented herein that background principles of Arkansas property law should bar this claim, the content of Arkansas law discussed in this brief remains relevant to the case. The qualified nature of Petitioner's legal rights as a riparian land owner under Arkansas law and the inherent risks associated with property ownership in a floodplain would be, at a minimum, highly relevant in determining "the extent to which [the actions of Respondent] interfere[d] with distinct investment-backed expectations." *Lingle v. Chevron USA*, 544 U.S. 528 (2005), quoting *Penn Central Trans. Co. v. City of New York*, 438 U.S. 104, 124 (1978). *Cf., Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1035 (Kennedy, J., concurring in the judgment) ("Coastal property may present such unique concerns for a fragile land system that the State can go further in regulating its development and use than the common law of nuisance might otherwise permit.").

II. ARKANSAS PRECEDENTS DEEM "REASONABLE" A RANGE OF RIPARIAN ACTIVITIES THAT CAUSE INTERFERENCE WITH USES OF RIPARIAN PARCELS MADE BY CO-RIPARIANS.

Although the Arkansas Supreme Court in fashioning its doctrine of reasonable use riparianism looked to cases and authorities beyond its borders, the court made it clear that the development of Arkansas' doctrine on the subject would be a function of Arkansas jurisprudence and not dictated by outside trends. In making that point, the *Harris* court stated, "In embracing the reasonable use theory we caution, however, that we are not necessarily adopting all the interpretations given it by the decisions of other states, and that our own interpretation will be developed in the future as occasions arise." *Id.* at 134. For that reason a federal court seeking precedents to guide its application of that doctrine should consider and rely upon Arkansas precedents to the fullest extent feasible.

A. Under Arkansas law of reasonable use riparianism, actions that affect flow may be held to be reasonable and not infringe on the rights of the lower riparian, including actions that regularly increase inundation of downstream parcels.

Contemporary water law is, in the main, most concerned with effectively managing increasingly

strained sources of supply and is less often concerned with cases precipitated by the presence of too much water. However, reasonable use riparianism historically has protected against claims based on excessive releases of water. To cite but a single famous example, in *Mason v. Hoyle*, 14 A. 786 (Conn. 1888), a change in dam operations by an upper mill seat proprietor that caused periods of substantially increased flow was held unreasonable because it harmed lower millers by letting down the water in a torrent that over-topped their comparatively low dams and prevented them from beneficially using the water of the stream. Thus, despite the caveat that Arkansas cases should be the ones of primary interest, it remains important to recognize that the law of reasonable use riparianism has always been willing to entertain claims based on downstream effects caused by superfluity of water.

Somewhat surprisingly, in addition to the case *sub judice*, Arkansas has a very recent reasonable use riparianism case presenting a claim by a riparian challenging the actions of co-riparians and others that caused a rise in the water level to the detriment of the complaining riparian. That case, *South Flag Lake, Inc. v. Gordon*, 307 S.W.3d 601 (Ark. Ct. App. 2009), presented a complex set of facts and legal positions. The central factual claim of plaintiff Gordon was that defendants' addition of water to the lake interfered substantially with his riparian parcel, reducing its fast land extent by roughly two-thirds, to a dry land total of 50 acres, impairing the use of a hunting

house blind, and preventing efforts at re-vegetation of periodically inundated areas. *South Flag Lake*, 307 S.W.2d at 603-04. The defendant-appellees had engaged in pumping water into the lake in order to maintain the lake as an adequate reservoir for irrigation of more than 3,400 acres. *Id.*

On South Flag Lake's appeal, the plaintiff-appellant made efforts to avoid the application of reasonable use riparianism, which the trial court had employed to find no violation of property rights. Thus, as a threshold ruling, the Arkansas Court of Appeals first ruled that placing pumped water into the lake did not take the case out of the ambit of *Harris v. Brooks*. *Id.* at 605.[7] Second, the Arkansas Court of Appeals rejected a claim that downstream inundation cases ought to be treated more like a trespass case rather than a reasonable use riparianism case. *Id.* Finding that inundation caused by water uses of a co-riparian were subject to *Harris*, the appeals court in *South Flag Lake* turned to application of the factors that determine the reasonableness of correlative uses of the water course and its waters. *Id.* The fact finding below had credited testimony of engineers and state conservation officials that the irrigation economy of defendant-appellees would be severely affected

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[7] The court also set aside plaintiff's objections to applying the Arkansas doctrine of reasonable use based on the type of water being added to the lake in reliance on *Jones v. Oz-Ark-Val Poultry Co.*, 306 S.W.2d 111 (Ark. 1957) (holding that there was no good reason not to apply *Harris* to subterranean or pumped waters).

without the artificial recharge of Flag Lake and that the cost of deep wells as an alternative to pumping surface water from below the lake outlet back up into Flag Lake would cost many hundreds of thousands of dollars. *Id.* at 603, 606. Those impacts were compared to the trial testimony admission of the plaintiff that he had suffered no economic loss, and the denial of injunctive relief was affirmed on that basis (using *Harris* factor 5, comparing the benefits to the respective parties). *Id.* at 605-08. While the other *Harris* factors were not recited or explicitly analyzed, the credit given to the expert testimony about the cost of alternative methods of protecting the irrigation economy of appellees implicates *Harris* factor 2, the "necessity" of the use as a consideration in the decision.

Even though the facts on the balance of impacts to the co-riparians make *South Flag Lake* a very one-sided and easy case to decide, three points of present importance arise from the court's analysis. First, importantly for Petitioner and consistent with the broad contours of reasonable use riparianism, downstream inundation may be the basis for stating a claim that the upstream riparian use is unreasonable. Second, importantly for Respondent, upstream riparian uses that result in downstream inundation are not *per se* unreasonable. Third, the usual methodology for ascertaining reasonableness of a riparian use is applied. Accordingly, the actions of the *South Flag Lake* co-riparians which caused the inundation of the complaining riparian's parcel were held to be reasonable under the circumstances. *Id.*

B. Under Arkansas law of reasonable use riparianism, activities that substantially affect stream flow during a defined period of time may be held to be reasonable and not infringe on the rights of the co-riparian.

The facts of the AGFC case at bar involve a multi-year seasonal alteration of the flow of a watercourse that is alleged to be an unreasonable riparian use due to interference with the complaining riparian's ability to use its riparian land, in this case growing hardwoods on a portion of the Commission's lands lying in the Black River flood plain. In *Nilsson v. Latimer*, 664 S.W.2d 447 (Ark. 1984), an irrigation use-fishing use dispute between co-riparians located on opposite banks of a stream, the Arkansas Supreme Court faced a somewhat analogous pattern of seasonal interference with the use of the riparian parcel.

The events of *Nilsson* arose in the summer of a drought year when defendant-appellees pumped irrigation water from the stream to which both parties were held to be riparian. *Nilsson*, 664 S.W.2d at 448, 450. The irrigation use benefitted more than 1,000 acres of land, but the withdrawal of the irrigation water emptied several deep pools that plaintiff-appellant used for fishing. *Id.* at 450-1. The Chancellor below denied an injunction to plaintiff-appellant Nilsson after declining to find the offending use unreasonable. *Id.* at 450. In its review of the lower court's ruling the Arkansas Supreme Court immediately turned to *Harris v. Brooks*, including a portion

of the Restatement (First) of Tort §852(c) quotation stating the rule of law to be applied. *Id.* The Arkansas Supreme Court found Nilsson's injury insufficient to render the action of Latimer unreasonable:

> We stated in *Harris* that recreational and commercial uses were of equal status, and we affirm that view. However, we cannot clearly determine from the record that the deprivation suffered by Nilsson was more than negligible, and it is impossible to say that it went beyond the "reasonable amount of inconvenience and annoyance" which may be imposed upon one riparian owner by another when riparian rights compete. It should be noted that claims of lower riparian owners are not involved here.

Id. The decision of the majority provoked a dissent by Justice Hickman, who argued that there was an equality of right to the scarce water among co-riparians and that appellees had no ownership interest in the water, "although they acted as if they did." *Id.* at 451.

The very terse majority opinion on the riparian rights issue in *Nilsson* nevertheless offers insights pertinent to the decision of subsequent cases. As argued previously, there is no question that *Harris v. Brooks* establishes the controlling principles of analysis of riparian rights and the justifiable expectations of riparian proprietors in Arkansas. What also can be seen is that in *Nilsson*, despite the short shrift given to the fishing interest by the majority, the Arkansas

Supreme Court accepted as reasonable under the circumstances a non-permanent interference with an essential attribute of the riparian right, that of having a live stream and its fundamental character preserved. In finding the balance of interests so one-sided, the majority opinion also underscores the importance of irrigation water use in the Arkansas economy as a factor in the weighing of uses even though irrigation does not have a preference over recreation as a matter of law.

III. ARKANSAS PRECEDENTS APPLYING THE *HARRIS* FACTORS TEND TO SUPPORT A DETERMINATION THAT RESPONDENT IS NOT UNREASONABLY INTERFERING WITH JUSTIFIED EXPECTATIONS OF PETITIONER.

A. Under Arkansas law of reasonable use riparianism, the *Harris* factor 5 that compares the totality of benefits created by a co-riparian's actions with the impact on the adversely affected co-riparian is a critical factor in the Arkansas Supreme Court decisions.

The case holdings described in this brief review of the Arkansas precedents proceed from the application of the reasonable use riparianism standard of *Harris v. Brooks*. Significantly, the comparative utility of the conduct of the parties competing to make use of the water and properties comes to the fore in each of the cases. *Harris* itself, even with a series of factors,

foreshadowed the substantial weight that would be given to the comparative utility analysis by its elucidation of how the test should proceed from the Restatement (First) of Torts §852. Looking particularly at the last line of that quotation and adding emphasis, it states, "Substantial intentional harm to another cannot be justified as reasonable *unless the legal merit or utility of the activity which produces it outweighs the legal seriousness or gravity of the harm.*" *Harris v. Brooks*, 283 S.W.2d 129, 135 (Ark. 1955). (Emphasis added.) That expression can be changed from an exception to an affirmative statement: "The legal merit or utility of an activity that produces substantial injury to a co-riparian may outweigh the harms and render the activity causing the harm reasonable." In that form, the rule has controlled the post-*Harris* cases.

Evaluation of both *Nilsson* and *South Flag Lake* through this lens, where the harm to the complaining riparian is treated as trivial or negligible, makes those cases easy ones to decide. That does not detract from the observation that the *Harris* factor 5 relating to the imbalance of benefits, is of great weight in the decisions. In the case at bar, the courts below have not made the appropriate effort required by Arkansas law to categorize or quantify the benefits created by the Corps' operation of the dam during either the pre-operational-change or post-operational-change period. That accounting will influence the application of Arkansas reasonable use riparianism to this case. Given the myriad of damages that are likely to be

avoided by a dam authorized for flood control purposes, the credit side of the ledger may be very large.

B. Under Arkansas' law of reasonable use riparianism, protection of irrigation use of water is often an important aspect in determining when a riparian activity is reasonable.

Water law has a long history of supporting a community's uses of water that sustain economic development.[8] In Arkansas, the importance of irrigation to the production of rice and other parts of the agricultural economy has been an element of prominence in the state's water law since at least the mention of its potential importance to the state in *Barboro v. Boyle*, 178 S.W. 378, 380 (Ark. 1915) through the most recent cases such as *Harris*, *Nilsson* and *South Flag Lake*. The objective to maximize water use is articulated explicitly in *Harris* when it states:

> *The law* accords equal protection to the interests of all the riparian proprietors in the use of water, and *seeks to promote the greatest beneficial use of the water*, and seeks to promote the greatest beneficial use by each with a minimum of harm to others.

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[8] *See, e.g.*, Robert H. Abrams, *Replacing Riparianism in the 21st Century*, 36 WAYNE L. REV. 93, 124 (1989); *see also*, Joseph W. Dellapenna, *The Law of Water Allocation in the Southeastern States at the Opening of the Twenty-First Century*, 25 U. ARK. LITTLE ROCK L. REV. 9 (2002).

Harris, 283 S.W.2d at 135. (Emphasis added.) While the harm to AGFC could have been minimized by continuing the former operating plan, this passage also makes it plain that an Arkansas court applying *Harris* would be alert to consider whether the Corps' actions may be of greater societal benefit, thereby making the rationale behind the Corps' change of dam operations significant in applying Arkansas law to the case. Although it is not fully articulated in the two opinions below,[9] the change of operations apparently was intended to protect downstream farmers from seasonal flooding and improve agricultural production in the Black River basin. *See* Petitioner's Brief on the Merits at 6-7, Arkansas Game and Fish Comm'n v. United States, No. 11-597 (U.S. June 27, 2012); *Arkansas Game & Fish Comm'n*, 637 F.3d 1366 (Fed. Cir 2011). The more rapid release of stored water in spring had the potential to provide benefits based on earlier planting of crops, by ending flooding of low lying fields at an earlier date.[10] Given the importance of the irrigated agricultural economy in the Black River region, and also the prominent

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[9] *See discussion supra* n. 4.

[10] Should the ultimate decision of the instant case require an in-depth consideration of the Arkansas doctrine of reasonable use riparianism, additional benefits of the Corps' operation of the Clearwater Dam would be relevant. So, for example, the greater reach of short-term flooding caused by the faster release of water in spring might assist in providing flood irrigation water for the growing of rice and the renewal of nutrients through increased sediment deposition.

protection given to irrigation uses in Arkansas reasonable use riparianism cases (*Harris* factor 1), those benefits would weigh heavily in the balance of interests.

CONCLUSION

For the forgoing reasons, in the event this case cannot be resolved solely by reference to takings law, the decision must consider the Arkansas property law that defines the nature and scope of Petitioner's asserted property interest. Although the matter is not wholly free of doubt, the Arkansas law of reasonable use riparianism favors a ruling that the actions of Respondent do not amount to an unreasonable interference with the rights of its downstream co-riparian the Arkansas Game & Fish Commission. In the absence of interference with Petitioner's state law property entitlements, there can be no taking of property and the decision of the United States Circuit Court for the Federal Circuit should be affirmed.

Respectfully submitted,

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AMICUS CURIAE BRIEF

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No. 11-597

IN THE
Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,

Petitioner,

v

UNITED STATES OF AMERICA,

Respondent

On Writ of Certiorari to the U.S. Court of Appeals for the Federal Circuit

BRIEF OF WASHINGTON LEGAL FOUNDATION AND ALLIED EDUCATIONAL FOUNDATION AS *AMICI CURIAE* IN SUPPORT OF PETITIONER

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Date July 5, 2011

QUESTION PRESENTED

When the Government adopts a policy that will foreseeable result in repeated physical invasions of private property by flood waters, but the policy is designated as temporary in nature, what test should be adopted in determining whether the policy results in a "taking" compensable under the Fifth Amendment?

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INTERESTS OF *AMICUS CURIAE*

The Washington Legal Foundation (WLF) is a public interest law and policy center with supporters in all 50 States. WLF devotes a substantial portion of its resources to defending free enterprise, individual rights, and a limited and accountable government.[1]

WLF has regularly appeared before this and other federal courts in cases involving claims arising under the Fifth Amendment's Takings Clause. *See, e.g., Phillips v. Washington Legal Found.*, 524 U.S. 156 (1998); *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 525 U.S. 302 (2002); *Brown v. Legal Found. of Washington*, 538 U.S. 216 (2003).

The Allied Educational Foundation (AEF) is a non-profit charitable foundation based in Englewood, New Jersey. Founded in 1964, AEF is dedicated to promoting education in diverse areas of study, such as law and public policy, and has appeared as *amicus curiae* in this Court on a number of occasions.

Amici are concerned that governments not be permitted to circumvent Takings Clause constraints by characterizing their challenged policies as temporary in nature. *Any* challenged policy can be characterized as temporary, in the sense that there is always the possibility that the policy will be lifted at some future date. *Amici* strongly believe that the approach adopted

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[1] Pursuant to Supreme Court Rule 37.6, *amici* state that no counsel for a party authored this brief in whole or in part; and that no person or entity, other than *amici* and their counsel, made a monetary contribution intended to fund the preparation and submission of this brief. All parties have consented to the filing of this brief; letters of consent have been lodged with the clerk.

by the court below – whereby a federal government water-release policy labeled "temporary" cannot give rise to a traditional Takings Clause analysis – is a recipe for emasculating the Takings Clause.

STATEMENT OF THE CASE

Every year between 1993 and 2000, the Army Corps of Engineers (the "Corps") adopted "planned deviations" from its normal schedule of water releases from the Clearwater Dam in southeast Missouri.[2] Those deviations entailed decreased water releases in the spring (when some farmers living downstream wanted reduced river levels during their planting season), and increased water releases during summer months. Petitioner Arkansas Game & Fish Commission (the "Commission") alleges that these deviations caused extended summer flooding of its wilderness area (located along the Black River, 115 miles downstream from the dam) – rendering its property unusable for months at a time and leading to the entirely foreseeable destruction of timber worth millions of dollars. The Corps persisted with the deviations despite repeated complaints from the Commission that the deviations were causing massive flooding damage. After the trees died, the Corps acknowledged the destructive effects of its deviations, abandoned plans to adopt the 1993-2000 release patterns as a permanent policy, and approved no more deviations.

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[2] The plan evidencing the Corps's normal schedule of water releases was adopted in 1953, soon after construction of the Clearwater Dam.

In 2005, the Commission filed suit against the United States (the "Government") under the Tucker Act, 28 U.S.C. § 1491, claiming that the 1993-2000 deviations and resultant floods constituted an uncompensated taking of its property in violation of the Fifth Amendment's Takings Clause. After, conducting a two-week trial, the Claims Court agreed and awarded the Commission nearly $5.8 million in compensation. Pet. App. 39a-161a.

The Claims Court held that the Commission, in order to prevail on its takings claim, was required to establish three factual elements by a preponderance of the evidence: (1) the Corps released water from the Clearwater Dam that "proximately and directly caused" the Commission's property (known as "the Management Area") to be flooded; (2) the flooding caused substantial damage to the property; and (3) the Government either intended to and did "take" the property, or it took actions "the natural consequence of which were to take" the property. *Id.* at 81a. The court concluded that the Commission introduced evidence sufficient to establish all three elements.

In particular, the Claims Court found that the Government intended to injure or invade the Management Area – based on a finding that "a reasonable investigation" would have revealed that the deviations would cause extended summer flooding of the Management Area and would damage the Commission's timber. *Id.* at 99a. The court concluded that the 1993-1999 deviations were the sole cause of the summer flooding in those years and were the sole cause of the substantial destruction of the Commission's timber in

the years 1999 and 2000. *Id.* at 104a-128a.

The court held that intentional Government water releases that result in foreseeable flooding constitute the acquisition of a flowage easement across the flooded property. *Id.* at 85a. It stated that a compensation is warranted under the Fifth Amendment "where a landowner can demonstrate that government actions subjected his or her land to intermittent, frequent, and inevitably recurring flooding." *Id.* at 87a (citations omitted). The court concluded that the Commission met that standard, based on the court's findings that: (1) the deviations "regularly inundated portions of the Management Area during the growing season to an extent not experienced previously; and (2) because of the "sustained nature" of the water releases during the growing seasons, "the flood waters would stay on the affected portions of the Management Area for an extended period." *Id.* at 88-89. It further held that the Government's flood-inducing water releases were not mere "isolated invasions that might merely constitute a tort." *Id.* at 89a.

A divided U.S. Court of Appeals for the Federal Circuit reversed. Pet. App. 1a-37a. The appeals court concluded that it need not address the Government's contention that various of the trial court's factual findings (particularly its finding that the flooding and resultant timber damage were entirely foreseeable) constituted "clear error." Rather, it held that the Commission's takings claims were precluded as a matter of law "because the deviations were by their very nature temporary and, therefore, cannot be 'inevitably recurring' or constitute the taking of a flowage

easement." *Id.* at 22a.

The appeals court held that "cases involving flooding and flowage easements are different" from run-of-the-mine takings cases and are controlled by a distinct set of judicial precedents. *Id.* at 18a. The court said that government-induced flooding cannot constitute a taking unless it is a "permanent invasion of the land," and that an invasion cannot be deemed "permanent" unless there exists a "permanent condition of continual overflow" or "a permanent liability to intermittent but inevitably recurring overflows." *Id.* at 18a-19a (quoting *United States v. Cress*, 243 U.S. 316, 328 (1917). The court concluded that because the Corps's deviations were approved on an annual basis during the 1993-1999 period and were never intended to constitute a new, permanent water-release policy, the flooding of the Management Area could not, by definition, be deemed "inevitably recurring." *Id.* at 27a-28a (noting that "the deviations in question were plainly temporary and the Corps eventually reverted to the permanent plan").

Judge Newman dissented. Pet. App. 29a-37a. She would have held that "when the invasion [of private property through flooding] preempts the owner's right to enjoy his property for an extended period of time, the principles of constitutional deprivation of property apply," and that the "eventual abatement of the flooding does not defeat entitlement to just compensation." *Id.* at 33a (citations omitted).

In August 2011, the appeals court denied the Commission's petition for panel rehearing and rehearing *en banc*. Pet. App. 164a. Judge Newman wrote an

opinion dissenting from the denial, as did Judge Moore (joined by Judges O'Malley and Reyna). *Id.* at 170a-179a. Judge Moore took issue with the panel's statement that "unlike other types of takings, flooding due to government action must constitute a 'permanent invasion" in order for the landowner to recover." *Id.* at 172a. He stated, "I think the Court of Federal Claims properly analyzed the eight years of release rate deviations and the recurring flooding that these caused and determined that the character of this government action – this repeated, consistent flooding – constituted a taking." *Id.* at 175a-176a.

Judge Dyk, the author of the panel decision, wrote an opinion concurring in the denial of the petition for rehearing *en banc*. *Id.* at 165a-169a. He stated that the panel decision did not preclude courts from looking behind a Government assertion that its water-release policy was "temporary" in nature. *Id.* at 168a. If the Government attempts to hide behind a "temporary" label by, for example, labeling 50 "consecutive and identical one year deviations" as a "temporary" policy, a landowner could properly assert a takings claim by challenging the "temporary" nature of the policy, he explained. *Id.* at 169a. A takings claim is precluded, however, when (as here) the evidence demonstrated that the Government adopted no long-term plan to continue its deviations from the standard release policy, he stated. *Id.*

SUMMARY OF ARGUMENT

The Federal Circuit erred in concluding that flooding cases are exempt from the rules normally

applicable to claims asserted under the Takings Clause. Under those rules, "Where the government authorizes a physical occupation of property (or actually takes title), the Takings Clause generally requires compensation." *Yee v. City of Escondido*, 503 U.S. 519, 522 (1992). In such cases, compensation is required "no matter how minute the intrusion, and no matter how weighty the public purpose behind it." *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1015 (1992). While a temporary physical occupation is obviously a more "minute . . . intrusion" than a permanent physical occupation, its temporary nature is not normally deemed a reason to deny compensation.

The Federal Circuit's decision to exempt flooding cases from normally applicable Takings Clause rules was based on a misreading of this Court's precedents. The Court stated in 1917 in *Cress* that flooding cannot form the basis for a takings claim unless it is either "permanent" or "inevitably recurring." 243 U.S. 316. The Federal Circuit apparently misinterpreted the phrase "inevitably recurring," interpreting it to mean "recurring for the indefinite future." To the contrary, the phrase merely requires the claimant to demonstrate that repeated flooding was the inevitable consequence of the government's actions and would continue so long as the government's action continued. When the Court has denied Takings Clause claims in flooding cases, it generally has done so because the claimant has failed to demonstrate that the government's policy was the actual cause of flooding, not because the policy was adopted on a temporary basis only or because the flooding did not continue indefinitely.

The concept of a government "taking" has traditionally been understood to include an element of volition; the Government generally is not deemed to have taken private property unless it intended to "take" the property or at least intended actions whose foreseeable and natural consequences would be the "taking" of the property. *See, e.g., Yee*, 503 U.S. at 522 (a taking occurs where the government "authorizes" a physical occupation of property). That volition requirement prevents the Government from being held liable to pay compensation every time a flood occurs in the vicinity of a Government dam. Thus, where a flood is more properly attributable to unexpectedly heavy rains rather than to dam construction, and for that reason its recurrence cannot be deemed "inevitable," no compensation is warranted. *Sanguinetti v. United States*, 264 U.S. 146 (1924). Once the volition requirement is satisfied, however, nothing in the Court's case law suggests that flooding cases should be treated differently from any other cases in which a property owner asserts a Takings Clause claim.

Where the repeated flooding of property is found to be the direct and foreseeable result of Government policy, the flooding can appropriately be deemed a "physical occupation" of the property by the Government. The Court has repeatedly stated that such physical occupation constitutes a *per se* taking that is always compensable, regardless whether the occupation is intended to be permanent or temporary. The Court has distinguished between permanent and temporary government policies only in the context of *regulatory* takings. *Tahoe-Sierra*, 535 U.S. at 323 (a permanent regulation that deprives a property owner of all value is

a *per se* taking; but courts assessing a Takings Clause challenge to a regulation that only temporarily deprives a property owner of all value must undertake "complex factual assessments of the purposes and economic effects of government actions."). Accordingly, the Court should rule that the Commission's claims are subject to a *per se* takings analysis.

The Government asserted in the Federal Circuit that several of the Court of Federal Claims's factual findings (particularly its findings regarding causation and foreseeability) constituted "clear error." The Federal Circuit did not address that assertion, but instead held that Takings Clause liability was precluded as a matter of law due to the temporary nature of the Government's deviations. Because the appeals court has not yet ruled on the Government's "clearly erroneous" argument, this Court should not address the argument in the first instance. *Amici* respectfully suggest that the Court reverse the appeals court's ruling that precluded Takings Clause compensation for "temporary" flooding. It should then remand the case to allow the appeals court to consider the Government's assertion that the trial court's judgment was based on clearly erroneous factual findings. The Federal Circuit should be instructed to affirm the trial court's judgment (on the basis of a *per se* takings theory) if it concludes that the challenged factual findings were not clearly erroneous.

ARGUMENT

I. FLOODING CASES ARE NOT EXEMPT FROM GENERALLY APPLICABLE TAKING CLAUSE PRINCIPLES, WHICH PERMIT COMPENSATION REGARDLESS WHETHER THE CHALLENGED POLICY IS PERMANENT

The Takings Clause of the Fifth Amendment provides, "[N]or shall private property be taken for public use, without just compensation." One of the principal purposes of the Takings Clause is "to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960).

The Court has repeatedly made clear that the Takings Clause is fully applicable *both* to government policies that take private property on a permanent basis *and* to government policies that do so on a temporary basis. *See, e.g., First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304 (1987) ("'temporary' takings which, as here, deny a landowner all use of his property, are not different in kind from permanent takings, for which the Constitution clearly requires compensation"); *San Diego Gas & Electric Co. v. San Diego*, 450 U.S. 621, 657 (1981) (Brennan, J., dissenting) ("Nothing in the Just Compensation Clause suggests that 'takings' must be permanent and irrevocable.").

Indeed, the Federal Circuit explicitly

acknowledged the validity of that principle as a general matter. Pet. App. 18a ("In general, if particular government action would constitute a taking when permanently continued, temporary action of the same nature may lead to a temporary takings claim."). The appeals court nonetheless concluded that "cases involving flooding and flowage easements are different" and that the constitutional protections normally afforded to landowners whose property is temporarily taken from them are inapplicable to temporary takings that result from government-induced flooding. *Id.* Deeming itself bound by its own precedent as well as precedent from this Court, the Federal Circuit held that flooding induced by a *temporary* government policy is not compensable because such flooding cannot be deemed to meet a prerequisite that it be "inevitably recurring." *Id.* at 21a. Because the Corps's 1993-1999 deviations were not implemented pursuant to a permanent water-release policy, the appeals court held that the Commission was categorically ineligible for compensation under the Takings Clause. *Id.* at 22a.

The Federal Circuit's decision to exempt flooding cases from normally applicable Takings Clause rules was based on a misreading of this Court's precedents and their reference to "inevitably recurring" flooding.

A. Floods Are Deemed "Inevitably Recurring" Whenever a Claimant Demonstrates That Repeated Flooding Was the Inevitable Consequence of the Government's Actions

The reference to "inevitably recurring" flooding

originated with the Court's 1917 *Cress* decision. In that case, the Court *upheld* the takings claims of two property owners whose property was adversely affected by the construction of locks and dams along rivers in Kentucky. One of the property owners demonstrated at trial that, as a result of erection of the locks and dams, 6.6 acres of his property was "subject to frequent overflows of water from the river, so as to depreciate it one half of its value." 243 U.S. at 318. The Court rejected the Government's contention that no taking is effected when government-induced flooding deprives the property owner of only a portion (rather than all) of the property's value. *Id.* at 328. The Court explained that "it is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines whether it is a taking." *Id.* Noting that it had ruled in two prior cases[3] that flooding of lands by "permanent" backwater created by dam construction is always compensable under the Takings Clause, the Court saw no reason to create a different rule when the dam causes flooding that would inevitably recur even if it does not create a continuous overflow: "There is no difference in kind, but only of degree, between a permanent condition of continual overflow by backwater and a permanent liability to intermittent but *inevitably recurring* overflows; and on principle, the right to compensation must arise in the one case as in the other." *Id.* (emphasis added).

We note initially that the issue of a temporary government policy was not at issue in *Cress* (*e.g.*, the

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[3] *Pumpelly v. Green Bay & M. Canal Co.*, 80 U.S. 166 (1871); *United States v. Lynah*, 188 U.S. 445 (1903).

Government had no plans to remove any of its locks and dams), and thus the Court had no occasion to consider whether property owners could obtain compensation for flooding caused by a temporary water-management policy. Accordingly, the Court's reference to "intermittent but inevitably recurring overflows" should not be read as passing judgment on the compensability of overflows that will recur but (due to the temporary nature of the government policy) will not necessary recur indefinitely.

Nonetheless, the rationale of *Cress* is strongly supportive of the Commission's position. *Cress* emphasized that courts should focus on the "character of the invasion," not its magnitude. *Id.* The Commission's situation is analogous to the plaintiff in *Cress*: the magnitude of its loss was tempered by the fact that the Corp's deviations were never adopted as a permanent policy and were eventually abandoned. But "the character of invasion" was similar to the invasions at issue in *Pumpelly* and *Lynah*: in each case, the property owner suffered substantial damage to the value of its property because of the government's intentional adoption of a challenged water management policy.

The Federal Circuit appears to have based its holding on a misunderstanding of *Cress*'s use of the phrase "inevitably recurring overflows." *See*, e.g., Pet. App. 21a (The condition leading to the 'intermittent, but inevitably recurring' flooding . . . must be permanent. Otherwise, it could not be 'inevitably recurring.'"). The appeals court appears to have interpreted the phrase as referring to events that will recur for all times. That is not the meaning of the word "inevitable." An event is

defined as "inevitable" if it is "incapable of being avoided or evaded." *Webster's New Collegiate Dictionary* (G. & C. Merriam Co. 1981). Thus, an event is "inevitably recurring" if recurrence of the event is "incapable of being avoided or evaded." Nothing about that phrase connotes recurrence on a permanent basis, or even the likelihood of recurrence on more than one occasion. The flooding of the Management Area that occurred in 1993 as a result of the Corps's deviations was "inevitably recurring" in the sense that the 1994-1999 flooding was entirely predictable based on the Corps's continuation of its deviations for a seven-year period.

The Court repeated its "inevitably recurring" language in several later flooding cases in which Takings Clause claims were raised. In none of those decisions did the Court suggest that government-induced flooding should not be deemed "inevitably recurring" (and thus ineligible for Takings Clause compensation) simply because the government's water-control policy was not permanent. *See, e.g., United States v. Kansas City Life Ins. Co.*, 339 U.S. 799, 810 n.8 (1950) (citing *Cress*'s "inevitably recurring" language and affirming award of compensation to landowner).

B. Although a Government "Taking" Requires an Element of Volition, the Claims Court Found That the Corps Adopted a Policy Whose Foreseeable Consequence Was Destructive Flooding of the Management Area

The concept of a government "taking" has

traditionally been understood to include an element of volition; the Government generally is not deemed to have taken private property unless it intended to "take" the property or at least intended actions whose foreseeable and natural consequences would be the "taking" of the property. *See, e.g., Yee*, 503 U.S. at 522 (a taking occurs where the government "authorizes" a physical occupation of property).

Thus, a potential Takings Clause claim does not arise simply because an individual claims that the Government is responsible for his property's depreciation in value. For example, if a nuclear power plant operated by a government-owned utility suffers an accidental meltdown and radiation leaks into the atmosphere, nearby property owners almost surely will suffer a substantial loss in property value. The radiation contamination would not normally be deemed a Fifth Amendment "taking," however, because the contamination was not the direct result of an authorized government policy. Rather, if the Government could be shown to have acted negligently, the landowners could likely maintain a cause of action under the Federal Tort Claims Act.

This principle – that a Takings Clause claim can be maintained only where the invasion of private property is foreseeably caused by an authorized government policy – is well illustrated by the Court's *Sanguinetti* decision. In that case, the Government had constructed a canal in Stockton, California, as well as a "diversion dam" immediately below the intake to the canal. Engineers determined that the canal was sufficient to carry away all expected waters, and thus

they reasonably expected no flooding on the upland side of the dam. 264 U.S. at 147. However, "a flood of unprecedented severity" caused an overflow onto the Petitioner's property, and he sought compensation under the Takings Clause. The Court rejected the claim, finding that the flooding was neither foreseeable by the Government nor shown to have been caused by the Government's construction of a canal and dam:

> Prior to the construction of the canal the land had been subject to the same periodical overflow. If the amount or severity thereof was increased by reason of the canal, the extent of the increase is purely conjectural. Appellant was not ousted, now was his customary use of the land prevented, unless for short periods of time. If there was any permanent impairment of value, the extent of it does not appear. It was not shown that the overflow was the direct and necessary result of the structure; nor that it was within the contemplation of or reasonably to be anticipated by the government.

Sanguinetti, 264 U.S. at 149-150.

It is true, of course, that issues of foreseeability and causation may be more complex in a flooding case than in other sorts of cases that regularly arise under the Takings Clause. That is so because in flooding cases it is water, not government employees, that invade the landowner's property; foreseeability and causation will generally not be disputed by the Government when its own employees enter and take possession of the

property pursuant to a government policy.[4] Once the volition requirement is satisfied, however – that is, once the court determines that the Government intended to flood the property or to take actions whose natural and foreseeable consequences included the flooding – nothing in the Court's case law suggests that flooding cases should be treated differently from any other cases in which a property owner asserts a takings claim.

The Court of Federal Claims issued detailed factual findings regarding foreseeability and causation. It found that the Government intended to injure or invade the Management Area – based on a finding that "a reasonable investigation" would have revealed that the deviations would cause extended summer flooding of the Management Area and would damage the Commission's timber. Pet. App. at 99a. The court also found that the 1993-1999 deviations were the sole cause of the summer flooding in those years and were the sole cause of the substantial destruction of the Commission's timber in the years 1999 and 2000. *Id.* at 104a-128a. Indeed, while some flooding would have occurred if the Corp had adhered to its 1953 water-release plan or if the

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[4] *Amici* note that the Court has regularly recognized Takings Clause claims in cases in which the property invasion occurs pursuant to a Government policy but it is not the Government itself that undertakes the invasion. *See*, e.g., *Dolan v. City of Tigard*, 512 U.S. 374 (1994) (Takings Clause violation found where city required property owner to permit pedestrians and bicyclists to traverse her property; *Brown*, 538 U.S. at 235 (State of Washington required that interest earned on trust accounts be transferred to a private foundation dedicated to providing legal services for the indigent); *Causby v. United States*, 328 U.S. 254 (1946) (federal government established airport that caused private planes to invade the airspace of adjacent property owners.

Clearwater Dam had never been built, the Court concluded that the destruction of timber would not have occurred under any of those alternative factual scenarios. *Id.* The Federal Circuit did not question any of those factual findings. Pet. App. 22a. Given those findings, the Federal Circuit erred in concluding that this case is not governed by this Court's standards governing temporary takings.

C. The Federal Circuit Erred by Establishing a Rule Barring All Flooding Claims Based on Temporary Government Policy

In its brief opposing the petition for a writ of certiorari, the Government asserts that the Federal Circuit did not, in fact, establish a blanket policy that bars all Takings Clause claims based on an assertion that flooding was caused by a temporary government policy. U.S. Opp. Cert. 14-15. That assertion is without merit.

In an opinion concurring in the denial of the petition for rehearing *en banc*, Judge Dyk (the author of the panel decision) sought to elaborate on the panel's views regarding temporary takings claims. He explained that a Takings Clause claimant complaining of government-induced flooding could prevail by demonstrating that the challenged government policy was really a permanent policy even though the Government called it a temporary policy. Pet. App. 168a-169a. But that statement does nothing to change the blanket nature of the Federal Circuit's bar on claims based on a less-than-permanent water-release policy.

The concurring opinion makes clear that a Takings Claim is absolutely barred when (as here) the evidence demonstrates that the Government has adopted no long-term plan to continue the challenged water-release policy. As explained above, the Federal Circuit's categorical bar on temporary takings claims is inconsistent with established case law.

II. TEMPORARY TAKINGS ARE SUBJECT TO PER SE ANALYSIS WHEN, AS HERE, THERE IS A PHYSICAL INVASION OF THE PROPERTY

Where the repeated flooding of property is found to be the direct and foreseeable result of Government policy, the flooding can appropriately be deemed a "physical occupation" of the property by the Government. In its flooding cases, the Court has repeatedly referred to Government-induced flooding of the property as an "invasion." *See, e.g., Cress*, 243 U.S. at 328. Such physical occupations are generally deemed to constitutes a *per se* taking that is *always* compensable, regardless whether the occupation is intended to be permanent or temporary.

For example, the Court explained in *Tahoe-Sierra*:

> When the government physically take possession of an interest in property for some public purpose, it has a categorical duty to compensate the former owner, *United States v. Pewee Coal Co.*, 341 U.S. 113, 115 (1951). Thus, compensation is mandated when a leasehold is

> taken and the government occupies the property for its own purposes, *even though that use is temporary. United States v. General Motors Corp.*, 323 U.S. 373 (1945); *United States v. Petty Motor Co.*, 327 U.S. 372 (1946).

Tahoe-Sierra, 535 U.S. at 322 (emphasis added).

At issue in *Tahoe-Sierra* was whether that same *per se* takings analysis should apply to temporary regulatory takings – that is, government regulations that *temporarily* deprive a landowner of the all value of his property. The Court had previously ruled that government regulations that permanently deprive a landowner of all economic value of his property, even though they do not entail any government intrusion under the property, are subject to a *per se* takings analysis. *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992). *Tahoe-Sierra* held that *per se* analysis should not be applied to temporary regulatory takings. Rather, the Court held, temporary regulatory takings claims should be judged under the multi-factor balancing test set forth in *Penn Central Transportation Co. v. City of New York*, 438 U.S. 104 (1978).

In making that determination, the Court went to great pains to distinguish regulatory takings cases from those in which the government has physically occupied the landowner's property. For example, it explained:

> For the same reason that we do not ask whether a physical appropriation advances a substantial government interest or whether it deprives the owner of all economically valuable use, we do not

> apply our precedent from the physical takings context to regulatory takings claims. Land use regulations are ubiquitous and most of them impact property values in some tangential way – often in completely unanticipated ways. Treating them all as *per se* takings would transform government regulation into a luxury few governments could afford. By contrast, physical appropriations are relatively rare, easily identified, and usually represent a greater affront to individual property rights.

Tahoe-Sierra, 535 U.S. at 323-24.

The Court's statement that "we do not ask whether a physical appropriation advances a substantial government interest or whether it deprives the owner of all economically valuable use," is further confirmation that *Tahoe-Sierra* mandates use of *per se* takings analysis in all cases involving a "physical appropriation" – regardless whether the appropriation is temporary or permanent. An examination of whether a government policy "advances a substantial government interest" and whether it "deprives the owner of all economically valuable use" are, of course, two of the hallmarks of a *Penn Central* takings analysis. Stating that such analysis is never appropriate when the government has appropriated property is another way of saying that *per se* takings analysis is mandated. *See also Brown*, 538 U.S. at 235 (*per se* taking analysis is applicable to state program that temporarily appropriates private funds of private individuals in order to generate interest for use by legal services groups).

Moreover, *per se* takings analysis applies to cases involving physical invasions, regardless how small the damages or how brief the invasion. As the Court has explained, the extent of the invasion is largely irrelevant, because "[t]he Fifth Amendment draws no distinction between grand larceny and petty theft." *Hodel v. Irving*, 481 U.S. 704, 727 (1987) (Stevens, J., concurring). Of course, the six-to-seven years of physical invasions that occurred here would, in any event, preclude any assertion that this case involves only isolated flooding.

In sum, the Commission's claim that the Government physically invaded the Management Area with its flood waters is subject to *per se* takings analysis. If the Claims Court's principal factual findings (foreseeability and causation) are not clear error, a *per se* analysis requires that the Commission is entitled to compensation for all its losses.

The Government asserts that Court of Federal Claims's causation and foreseeability findings were, in fact, clearly erroneous. The Federal Circuit did not address that assertion, however, but instead held that Takings Clause liability was precluded as a matter of law due to the temporary nature of the Government's deviations. Because the appeals court has not yet ruled on the Government's "clearly erroneous" argument, this Court should not address the argument in the first instance. The Court recently explained:

> [W]hen we reverse on a threshold question, we typically remand for resolution of any claims the lower courts' error preventing them from

> addressing. *See, e.g., Bond v. United States*, 131 S. Ct. 2355, 2359 (2011) (reversing the Court of Appeals' determination on standing and remanding because the "merits of petitioner's challenge to the statute's validity are to be considered, in the first instance, by the Court of Appeals.").

Zivotofsky v. Clinton, 132 S. Ct. 1421, 1430-31 (2012).

Amici respectfully suggest that the Court reverse the appeals court's ruling that precluded Takings Clause compensation for "temporary" flooding. It should then remand the case to allow the appeals court to consider the Government's assertion that the trial court's judgment was based on clearly erroneous factual findings. The Federal Circuit should be instructed to affirm the trial court's judgment (on the basis of a *per se* takings theory) if it concludes that the challenged factual findings were not clearly erroneous.

CONCLUSION

Amici curiae request that the Court reverse the decision of the court of appeals.

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AMICUS CURIAE BRIEF

RECORD
AND
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In the
Supreme Court of the United States

ARKANSAS GAME & FISH COMMISSION,

Petitioner,

v.

UNITED STATES,

Respondent.

On Writ Of Certiorari
To The United States Court of Appeals
For The Federal Circuit

BRIEF OF WOLFSEN LAND & CATTLE CO., et al., AS AMICI CURIAE IN SUPPORT OF REVERSAL

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QUESTION PRESENTED

Early takings cases involved taking by flooding, and the holdings used terms such as "inevitably recurring" or "permanent," but without analysis. Modern takings cases hold that temporary takings claims can arise in the context of physical takings. But the Federal Circuit ignored recent takings decisions, holding that the six–year flooding of the Petitioner's land was not a taking because it was not "inevitably recurring" or "permanent." Should the Federal Circuit be reversed?

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The Wolfsen Land and Cattle Company, Turner Island Farms, Inc., West Turner Island Ranch, Lone Willow Ranch, Don C. and Lynn W. Skinner, Lawrence Scott Skinner, Thomas Clay Skinner, Laurel Lynn Skinner, Stacie L. Skinner–Hanson, Lawrence John Wolfsen, Mew Ventures, LP, Robert H. Mueller, Joanne Mueller, and various other Wolfsen, Skinner, and Mueller family–related companies, as amici curiae, respectfully submit that the decision of the Federal Circuit Court of Appeals should be reversed.

Interests of Amici Curiae

Amici curiae (collectively "Wolfsen amici") own approximately 12,973 acres of valuable and productive farm land located in the San Joaquin River basin in California's Central Valley.[1]

The Wolfsen amici currently face having their prime agricultural land, buildings, and crops repeatedly flooded and their crops and buildings

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[1] In accordance with this Court's Rule 37.6, the Wolfsen amici state that no counsel for a party authored this brief in whole or in part, and no party provided any funds for the preparation and submission of this brief. Both parties have consented to the filing of this brief.

destroyed over a number of years due to Congress's passage of the San Joaquin River Restoration Settlement Act, Pub. L. 111-11, 123 Stat. 991 (2009), and implementation of that statute by the United States Bureau of Reclamation.

The San Joaquin River is the main artery of California's second-largest river system. The river is also an important part of the Central Valley Project, the largest federal water management project in the United States. As part of the Central Valley Project, the United States Bureau of Reclamation operates the Friant Dam, built and designed in the 1940s to store most of the San Joaquin River's flow, diverting that water to irrigate more than a million acres of farmland, including farmland owned by Wolfsen amici.

Since 2009, Reclamation has operated the Friant Dam to meet the requirements of the San Joaquin River Restoration Settlement Act, Pub. L. 111-11, 123 Stat. 991. That statute, which is intended to reintroduce salmon stocks that have been absent from the river for more than sixty years, requires interim releases of water for initial experimentation, as well as later permanent releases from Friant Dam. Dry for more than half a century, the channel of the San Joaquin is choked with vegetation and soil. Having lost much of its capacity to transport water, the river channel easily overflows onto adjacent lands, including Wolfsen amicis' farmlands, damaging their lands and crops. The same is true for many of their farming neighbors up and down the original river channel.

These interim releases of water, which will occur sporadically over the next several years as the Government attempts to find the best way of assisting the salmon to migrate up and down the 123–mile length of the San Joaquin River, arguably do not meet the "permanent" or "inevitably recurring" standard set out by the Federal Circuit in this case and applying this decision as the law of the circuit may well deny the Wolfsen amici any compensation for the taking of their property by this temporary but intentional flooding of their land and crops.

Wolfsen amici thus have a direct interest in ensuring that their property rights and the rights of other agricultural landowners be protected against Government destruction and invasion by flooding without payment of just compensation as the Fifth Amendment requires. As current decisions such as *First English Evangelical Lutheran Church v. Los Angeles County*[2] of this Court confirm, for the Fifth Amendment to remain meaningful, all takings of private property—even the taking of temporary flowage easements by flooding—if they result in the

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[2] *First English Evangelical Lutheran Church of Glendale v. Los Angeles County, Cal.*, 482 U.S. 304 (1987).

destruction of private property and the ouster of the owner of that property for any significant period of time, require payment of just compensation.

Statement

1. In a 2-1 split decision, the Federal Circuit held that the Arkansas Game & Fish Commission was not entitled to just compensation for the United States's repeated and intentional flooding of its woodlands over a period of six years. The issue in the case was whether a flowage easement was taken, within the meaning of the Fifth Amendment, by the Army Corps of Engineers's periodic, temporary flooding of a state-owned Wildlife Management Area.

In determining that no taking had occurred, the Federal Circuit penned a decision that could well have been written 150 years ago. Relying on early decisions written when takings law was in its infancy, the Federal Circuit ruled that the six years of recurring flooding that destroyed valuable hardwood timber was not sufficiently "permanent" or "inevitably recurring" to constitute a taking.

That the decision echoes early takings cases is not, in and of itself, the problem. Rather, the

problem is that the Federal Circuit has continued to apply these early holdings in cases that also happen to involve the takings of flowage easements by flooding as if takings law had not evolved. In short, although takings law has moved beyond the early takings cases involving flooding, venerable cases such as *Pumpelly*,[3] *Cress*,[4] and *Dickinson*,[5] takings law in the Federal Circuit has not likewise evolved—when the taking involves flooding.

As a result, the Federal Circuit analyzed the taking of a flowage easement in this case under a test that uniquely applies to flooding cases. As such, the Federal Circuit's flooding takings test is entirely out of sync with modern takings jurisprudence, including this Court's rulings in cases such as *First English Evangelical Lutheran Church v. Los Angeles County*.[6] The Federal Circuit's flooding takings test also fails to explain why a six–year period of flooding was not cognizable as a permanent taking or as a temporary taking.

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[3] *Pumpelly v. Green Bay & Mississippi Canal Co.*, 80 U.S. 166 (1871).

[4] *United States v. Cress*, 243 U.S. 316 (1917).

[5] *United States v. Dickinson*, 331 U.S. 745 (1947).

[6] *First English Evangelical Lutheran Church of Glendale*, 482 U.S. 304 (1987).

In *Hendler v. United States*,[7] a case involving the EPA's installation of underground monitoring wells on privately owned land for a period of years, the Federal Circuit explained that "permanent" in the context of a physical occupation can mean a taking of a finite number of years:

> In this context, "permanent" does not mean forever, or anything like it. A taking can be for a limited term—what is "taken" is, in the language of real property law, an estate for years, that is, a term of finite duration as distinct from the indefinite term of an estate in fee simple absolute. *See generally* Cribbet, *Principles of the Law of Property* 54 (3d ed. 1989).[8]

The *Hendler* court also described temporary trespasses as transient, and inconsequential. So described, the taking for the six years of flooding that occurred here is not a temporary trespass. In addition, the six years of flooding permanently transformed the habitat and destroyed valuable hardwood timber:

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[7] *Hendler v. United States*, 952 F.2d 1364 (Fed. Cir. 1991).
[8] *Hendler*, 952 F.2d at 1376.

> If the term "temporary" has any real world reference in takings jurisprudence, it logically refers to those governmental activities which involve an occupance that is transient and relatively inconsequential, and thus properly can be viewed as no more than a common law trespass *quare clausum fregit*. Our truckdriver parking on someone's vacant land to eat lunch is an example. . . . When the governmental intrusion is as substantial a physical occupancy of private property as this is, *Loretto* establishes that there is a taking.[9]

2. In this case, the U.S. Army Corps of Engineers built the Clearwater Lake and Dam in Missouri in the 1940s to control flooding on the Black River. Since 1948, the Corps has controlled releases of water from the Lake and Dam. In 1953, the Corps set forth in a Clearwater Lake Control Manual its guidelines for releasing stored water. In this case, although the Corps may have described its changes to the 1953 Clearwater Lake Control as "deviations,"

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[9] *Hendler*, 952 F.2d at 1377.

there was no deadline set for when the Corps would no longer be deviating from its 1953 Manual. The deviations, in short, were begun with an indefinite duration intended.

Had the Petitioner not complained to the Corps, presumably the Corps would have continued its deviations. That the Corps stopped prior to the filing of this lawsuit does not change the fact that the original releases were launched with no definite termination point identified.

3. The trial court held that "the inundations during growing seasons from 1993 through 1999 were recurrent and constituted an appropriation, albeit a temporary rather than permanent one because the Corps terminated its deviations."[10] The temporary flowage easement in turn caused a permanent taking of the timber. The trial court held the Federal Government liable for a temporary taking of a flowage easement over land and permanent taking of timber, awarding damages of $5.7 million.

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[10] *Arkansas Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 619–620 (2009).

Focusing only on the flowage easement, a divided panel reversed the trial court's decision, holding that the flooding did not rise to the level of a taking because the flooding was not permanent or inevitably recurring.[11] This conclusion was bolstered by the Corps's description of its changes to the 1953 Lake Control Manual as "deviations."

But the dissenting judge disagreed, pointing out that the temporary flooding must be a temporary taking. The dissent further contended that the damage to the timber is permanent, thus a complete reversal was not warranted.[12]

This debate continued in the opinions denying rehearing and rehearing en banc. A 7-4 majority of the Federal Circuit judges denied rehearing,[13] with three judges agreeing that there was no taking because "[t]he United States Army Corps of Engineers ("Corps") made a series of ad hoc and independent decisions to deviate from the normal release rates at a dam in Missouri, which sometimes

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[11] *Arkansas Game & Fish Comm'n v. United States*, 637 F.3d 1366 (Fed. Cir. 2011), *cert. granted*, 132 S. Ct. 1856 (U.S. 2012).
[12] *Arkansas Game & Fish Comm'n*, 637 F.3d at 1379–1383.
[13] *Arkansas Game & Fish Comm'n v. United States*, 648 F.3d 1377 (Fed. Cir. 2011).

caused intermittent flooding on the plaintiff's property."

But the dissenting judges focused instead on the nature of the Corps's actions, not just how the Corps described its actions:

> An early Supreme Court decision, *United States v. Cress*, 243 U.S. 316, 328 (1916), handed down well before the development of the concept of 'temporary takings' as it is understood today, talked in terms of requiring that for flooding to constitute a taking, it must be "inevitably recurring." But that does not preclude the possibility that a government action labeled "temporary" could give rise to such "inevitably recurring" flooding. To allow the government's "temporary" label for the release rate deviations to control the disposition of this case elevates form over substance and leads to untenable results with enormous future consequences.[14]

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[14] *Arkansas Game & Fish Comm'n*, 648 F.3d at 1380–1381 (parallel citation omitted).

Summary of Argument

Over the years, this Court has rendered decisions in a number of significant takings cases involving flooding, including the first inverse condemnation takings case ever decided by the Supreme Court. In 1871, the Court held in *Pumpelly v. Green Bay & Mississippi Canal Co.*[15] that the State of Wisconsin must pay just compensation, under the Wisconsin just compensation clause, for the resulting "overflow" of water on privately owned land caused by the construction of a dam. In *Pumpelly*, the flooding was permanent, "the overflow remained continuously from the completion of the dam,"[16] so that there was "an almost complete destruction of the value of the land."[17]

In the following decades, the Court continued to render takings decisions in flooding cases, and the term "permanent" was repeated in decisions without any further analysis. In *United States v. Cress*,[18] the Court added the notion of "inevitably recurring" to the taking, stating that "[t]here is no difference of

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[15] *Pumpelly*, 80 U.S. 166.
[16] *Id.* at 177.
[17] *Id.*
[18] *Cress*, 243 U.S. 316.

kind, but only degree, between a permanent condition of continual overflow by backwater and a permanent liability to intermittent but inevitably recurring overflows . . . ."[19] And in *United States v. Dickinson*,[20] the Court found the taking of a flowage easement "taken by the United States to flood permanently land belonging to [plaintiffs]" without any discussion of the role that "permanent" played in the analysis.[21]

The Federal Circuit has continued to quote from these decisions, without stopping to ask if the use of the term "permanent" or "inevitably recurring" are simply artifacts. So, when the Federal Circuit rendered its decision in this case—stating its rule that these floods were not a taking—it did so without ever explaining how many floods are required before a flowage easement has been taken.

Modern takings cases decided by this Court suggest that repeated references to "permanent" and "inevitably recurring" in the flooding decisions may not be justified. Specifically, although not in the context of flooding, in *First English Evangelical Lutheran Church v. County of Los Angeles*, this

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[19] *Id.* at 328.
[20] *Dickinson*, 331 U.S. 745.
[21] *Dickinson*, at 747.

Court held that a temporary regulatory taking requires payment of just compensation.[22] More recently, in *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*,[23] the Court allowed the government some breathing room or "normal delays" in land–use decision making, but nevertheless stood firmly behind the notion of temporary takings.

So it is against this backdrop that now, 141 years after *Pumpelly* was decided, the Arkansas Game & Fish Commission has asked the Supreme Court to decide if the federal government must pay just compensation for flooding of state–owned land resulting from releases of water from the Clearwater Lake and Dam for six consecutive years. The question, at bottom, is whether this Court will carve out a special exception in takings law applicable only to taking by flooding, or will the Court fold flooding cases into the overall modern takings framework.

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[22] *First English Evangelical Lutheran Church of Glendale*, 482 U.S. 304 (1987).

[23] *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302 (2002).

Argument

Under the Federal Circuit's decision in this case, the physical taking of a flowage easement by flooding for a period of years stands alone under the Fifth Amendment. According to the Federal Circuit, the Government can flood, destroy, and oust the owner of land from his or her property for as many years as it wants—so long as the Government is careful to describe its actions as "deviations" or even more devilish—"temporary." Sanctioning power to invade private property—with no constitutional restraints whatsoever imposed—so long as the Government decisionmaker is careful in how he or she describes its actions is precisely the result the framers of our Constitution hoped to avoid by including the Just Compensation Clause in the Constitution. A flood—even inevitably recurring in the eyes of the Federal Circuit—should not be able to escape constitutional scrutiny simply because inevitably recurring floods occur only temporarily.

I. The Fifth Amendment requires compensation for all takings—and does not distinguish between permanent and temporary takings

This Court has repeatedly recognized that the Fifth Amendment requires just compensation for temporary takings just as it does for permanent takings. In the leading case on this issue, *First English Evangelical Church v. Los Angeles County*,[24] this Court reversed the California Supreme Court and held that where the ordinance "denied appellant all use of its property for a considerable period of years . . . invalidation of the ordinance without payment of fair value for the use of the property during this period of time would be a constitutionally insufficient remedy."[25] And in *First English* this Court also held that "where the government's activities have already worked a taking of all use of property, no subsequent action by the government can relieve it of the duty to provide compensation for the period during which the taking was effective."[26]

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[24] *First English Evangelical Lutheran Church of Glendale*, 482 U.S. 304 (1987).
[25] *Id.* at 321–322.
[26] *Id.* at 321.

In *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, this Court stated:

> When the government physically takes possession of an interest in property for some public purpose, it has a categorical duty to compensate the former owner, *United States v. Pewee Coal Co.*, 341 U.S. 114, 115 (1951), regardless of whether the interest that is taken constitutes an entire parcel or merely a part thereof. Thus, compensation is mandated when a leasehold is taken and the government occupies the property for its own purposes, even though that use is temporary. *United States v. General Motors Corp.*, 323 U.S. 373, (1945); *United States v. Petty Motor Co.*, 327 U.S. 372, (1946).[27]

Likewise, in *United States v. General Motors Corporation*[28] this Court stated that "[t]he right to occupy, for a day, a month, a year, or a series of years, in and of itself and without reference to the

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[27] *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. at 322 (parallel citations omitted).

[28] *United States v. Gen. Motors Corp.*, 323 U.S. 373 (1945).

actual use, needs, or collateral arrangements of the occupier, has a value."[29] And in *United States v. Dow*,[30] this Court ruled that:

> [W]henever the Government enters into possession of property without filing a declaration of taking and without otherwise providing compensation for acquisition of the title . . . compensation would be measured by the principles normally governing the taking of a right to use property temporarily. *See Kimball Laundry Co. v. United States*, 338 U.S. 1; *United States v. Petty Motor Co.*, 327 U.S. 372; *United States v. General Motors Corp.*, 323 U.S. 373.[31]

Finally, in *United States v. Pewee Coal*,[32] this Court again ruled that "[h]aving taken Pewee's property, the United States became liable under the Constitution to pay just compensation. Ordinarily, fair compensation for a temporary possession of a

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[29] *Gen. Motors Corp.*, 323 U.S. at 380.
[30] *United States v. Dow*, 357 U.S. 17 (1958).
[31] *Id.* at 26 (parallel citations omitted).
[32] *United States v. Pewee Coal Co.*, 341 U.S. 114 (1951).

business enterprise is the reasonable value of the property's use."[33]

In fact, the United States government routinely condemns and pays for flowage easements, including temporary flowage easements, as the following cases illustrate:

- In *United States v. Virginia Electric & Power Co.*,[34] "the Government acquired by condemnation a flowage easement over 1840 acres of fast lands adjacent to the Dan River, a navigable tributary of the Roanoke," and this Court was asked to review the compensation award.[35]

- In *United States v. 79.93 Acres of Land in Breckinridge and Meade Counties, Kentucky*,[36] the Government "filed condemnation suits for certain permanent and temporary flowage easements over two tracts

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[33] *Pewee Coal Co.*, 341 U.S. at 117.

[34] *United States v. Virginia Elec. & Power Co.*, 365 U.S. 624 (1961).

[35] *Virginia Elec. & Power Co.*, 365 U.S. at 624–625.

[36] *United States v. 79.39 Acres of Land in Breckinridge & Meade Counties, Ky.*, 440 F.2d 1190 (6th Cir. 1971).

of farmland owned by defendants-appellants . . . ."[37]

- In *United States v. 91.90 Acres of Land, Situate in Monroe County, Missouri*,[38] "[t]he government condemned a little more than 87 acres of the land in fee, and it also imposed permanent flowage easements with respect to two ravines; those easements affected 4.9 acres of land."[39]

- In *United States v. 21.54 Acres of Land, More or Less, in Marshall County, State of West Virginia*,[40] "[b]y means of . . . declarations, the United States acquired flowage easements necessitated by the harbor and river

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[37] *79.39 Acres of Land in Breckinridge & Meade Counties, Ky.*, 440 F.2d at 1190.

[38] *United States v. 91.90 Acres of Land, Situate in Monroe County, Mo.*, 586 F.2d 79 (8th Cir. 1978).

[39] *91.90 Acres of Land, Situate in Monroe County, Mo.*, 586 F.2d at 82.

[40] *United States v. 21.54 Acres of Land, More or Less, in Marshall County, State of W. Va.*, 491 F.2d 301 (4th Cir. 1973).

improvement project known as the Hannibal Locks and Dam Project on the Ohio River."[41]

II. The use in early flooding cases of "permanent" and "inevitably recurring" was fortuitous and did not announce a doctrine of takings law

The Federal Circuit's conclusion that a flowage easement must be permanent—that there can be no just compensation for the taking of a temporary flowage easement—rests on a few fortuitously coined words from the early days of inverse condemnation law. As this Court explained in *Lingle v. Chevron*,[42] "[o]n occasion, a would-be doctrinal rule or test finds its way into our case law through simple repetition of a phrase—however fortuitously coined."[43] As the *Lingle* Court further stated:

> Twenty-five years ago, the Court posited that a regulation of private property "effects a taking if [it] does not substantially advance [a]

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[41] *21.54 Acres of Land, More or Less, in Marshall County, State of W. Va.*, 491 F.2d at 303.
[42] *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528 (2005).
[43] *Lingle*, 544 U.S. at 531.

> legitimate state interes[t]." The lower courts in this case took that statement to its logical conclusion, and in so doing, revealed its imprecision. Today we correct course.[44]

Here, as this Court ruled in *Lingle*, the time has come for this Court to correct course by clarifying a Fifth Amendment constitutional principle: That just compensation is due for the taking of temporary flowage easements, just as it is for the temporary taking of other property interests.

The origin of the "permanent" language is found in *Pumpelly v. Green Bay & Mississippi Canal Co.*, the first inverse condemnation case decided by this Court.[45] In that case, Wisconsin authorized the construction of a dam that resulted in the plaintiff's land being flooded, resulting in the loss of all value of that land:

> The declaration states that, by reason of the dam, the water of the lake was so raised as to cause it to overflow all his land, and that the overflow

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[44] *Lingle*, 544 U.S. at 548.
[45] *Pumpelly*, 80 U.S. 166.

> remained continuously from the completion of the dam, in the year 1861, to the commencement of the suit in the year 1867, and the nature of the injuries set out in the declaration are such as show that it worked an almost complete destruction of the value of the land.[46]

In *Pumpelly*, there was no dispute that the land was permanently flooded, only whether Wisconsin was required to pay just compensation. So as this Court correctly held, Wisconsin had taken the full value of the land by flooding, and was required to pay for that full value under Wisconsin's just compensation clause:

> It would be a very curious and unsatisfactory result, if in construing a provision of constitutional law, always understood to have been adopted for protection and security to the rights of the individual as against the government, and which has received the commendation of jurists, statesmen, and commentators as

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[46] *Id.* at 177.

> placing the just principles of the common law on that subject beyond the power of ordinary legislation to change or control them, it shall be held that if the government refrains from the absolute conversion of real property to the uses of the public it can destroy its value entirely, can inflict irreparable and permanent injury to any extent, can, in effect, subject it to total destruction without making any compensation, because, in the narrowest sense of that word, it is not taken for the public use.[47]

The only issue decided in *Pumpelly* was whether the permanent flooding of property can result in an uncompensated taking—not whether a temporary flooding can also result in an uncompensated taking.

In *United States v. Cress*[48] this Court used the fortuitous "inevitably recurring" phrase, and again did so without analysis. There, the federal government built two dams on the Cumberland and Kentucky rivers, causing "frequent overflows of

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[47] *Id.* at 177–178.
[48] *Cress*, 243 U.S. 316.

water from the river" over part of the plaintiffs' property. The Court, citing *Pumpelly*, held that the frequent overflows had taken Cress's property even though they had not completely destroyed the value of the property: "There is no difference of kind, but only of degree, between a permanent condition of continual overflow by backwater and a permanent liability to intermittent but inevitably recurring overflows . . . ."[49]

In *Cress*, there was no discussion of how "permanent" or "inevitably recurring" the flooding needed to be in order for the Court to find an uncompensated taking. The Court simply found that the alleged overflows had taken the plaintiff's property.

In subsequent cases this Court continued to cite *Pumpelly* and *Cress*, quoting the "permanent" and "inevitably recurring" language, but without engaging in any analysis of that language. For example, in *Northern Transportation Company v. City of Chicago*,[50] seven years after *Pumpelly* was decided the Court denied an inverse condemnation claim by property owners who had been denied

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[49] *Cress*, 243 U.S. at 328.

[50] *N. Transp. Co. v. City of Chicago*, 99 U.S. 635 (1878).

access to their property during construction of a tunnel. Discussing *Pumpelly* (and a Supreme Court of New Hampshire case), the Court held that the interference of the plaintiffs' use of their property was not enough to work an uncompensated taking:

> In those cases it was held that permanent flooding of private property may be regarded as a 'taking.' In those cases there was a physical invasion of the real estate of the private owner, and a practical ouster of his possession. But in the present case there was no such invasion. No entry was made upon the plaintiffs' lot. All that was done was to render for a time its use more inconvenient.[51]

Likewise, in *United States v. Lynah*,[52] this Court again cited *Pumpelly's* "permanent injury" language in holding that the flooding of a rice farm as a result of Government-built dams on the Savannah River was a taking of private property for public use, again without engaging in any discussion

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[51] *N. Transp. Co.*, 99 U.S. at 642.
[52] *United States v. Lynah*, 188 U.S. 445 (1903).

of how permanent the flooding must be to invoke the Fifth Amendment:

> It is clear from these findings that what was a valuable rice plantation has been permanently flooded, wholly destroyed in value, and turned into an irreclaimable bog; and this as the necessary result of the work which the government has undertaken. Does this amount to a taking? The case of *Pumpelly v. Green Bay & M. Canal Co.* answers this question in the affirmative.[53]

Finally, in *United States v. Sponenbarger*,[54] this Court cited *Pumpelly* and *Cress*, noting that there were takings in those cases, but no taking where there was no flood: "While this Court has found a taking when the Government directly subjected land to permanent intermittent floods to an owner's damage, it has never held that the Government takes an owner's land by a flood program that does little injury in comparison with far greater benefits conferred."[55]

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[53] *Lynah*, 188 U.S. at 469.
[54] *United States v. Sponenbarger*, 308 U.S. 256 (1939).
[55] *Sponenbarger*, 308 U.S. at 267 (footnote omimtted).

III. The Fifth Amendment requires just compensation for the government's taking of a flowage easement, whether temporary or permanent

Because the Federal Circuit's holding in this case contradicts the vast body of constitutional law holding that the government must pay for a temporary taking just as for a permanent taking, this Court should reverse. As a recent commentator states, the Fifth Amendment does not distinguish between temporary and permanent takings:

> Whether a taking is characterized as temporary or permanent is of little significance in determining whether a taking has occurred and it is not conclusive on the issue of when a suit must be brought on a taking claim, but such characterization has a bearing on the measure of damages. When governmental action deprives a landowner of the use of his land for a temporary period of time, the Just Compensation Clause of the Fifth Amendment requires that the government pay the landowner for the value of the use of the land during this period.
>
> When a taking of property is temporary in nature, an owner is entitled to compensation under the

> same principles as permanent takings of property, whether the temporary taking is physical or regulatory in nature. A temporary taking differs from a permanent taking in two key respects. First, once the period of the taking expires, the owner's legal interest and possession of the property is reestablished. Second, the taking is for a definite period of time.[56]

The touchstone for the determination of whether a government action gives rise to a claim for just compensation under the Fifth Amendment is thus not whether the taking is temporary or permanent, but whether the government action requires the property owner alone to shoulder the burden of providing a benefit for the public: "The Fifth Amendment's guarantee . . . [is] designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole."[57]

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[56] KURTIS A. KEMPER, ELEMENTS AND MEASURE OF COMPENSATION IN EMINENT DOMAIN PROCEEDING FOR TEMPORARY TAKING OF PROPERTY, 49 A.L.R.6th 205, § 2 (2009)

[57] *Armstrong v. United States*, 364 U.S. 40, 49 (1960).

Physical invasions like flooding (whether temporary or permanent) are paradigmatic takings because, as the Federal Circuit itself has stated, they take the owner's right to exclude (especially to exclude the government), which is a fundamental characteristic of private property:

> In the bundle of rights we call property, one of the most valued is the right to sole and exclusive possession—the right to *exclude* strangers, or for that matter friends, but especially the Government.
>
> The notion of exclusive ownership as a property right is fundamental to our theory of social organization.
>
> . . .
>
> The intruder who enters clothed in the robes of authority in broad daylight commits no less an invasion of these rights than if he sneaks in the night wearing a burglar's mask. In some ways, entry by the authorities is more to be feared, since the citizen's right to

> defend against the intrusion may seem less clear. Courts should leave no doubt as to whose side the law stands upon.[58]

In a very real sense, the difference between so–called "permanent" and so–called "temporary" takings of easements is merely a difference in duration—and certainly not a distinction of constitutional significance. As the Federal Circuit itself stated:

> In this context, "permanent" does not mean forever, or anything like it. A taking can be for a limited term—what is "taken" is, in the language of real property law, an estate for years, that is, a term of finite duration as distinct from the indefinite term of an estate in fee simple absolute. *See generally* Cribbet, *Principles of the Law of Property* 54 (3d ed. 1989).[59]

Finally, the Fifth Amendment's guarantee of just compensation when private property is taken for

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[58] *Hendler*, 952 F.2d at 1374, 1375.

[59] *Hendler*, 952 F.2d at 1376.

public use cannot be defeated because government action is a "deviation" from prior practice. For the right to just compensation has never been dependent on what the government says it is doing, but rather on what government actually does:

> When [the Government] takes the property, that is, the fee, the lease, whatever [the owner] may own, terminating altogether his interest, under the established law it must pay him for what is taken.[60]

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[60] *Gen. Motors Corp.*, 323 U.S. at 382.

CONCLUSION

The decision of the Federal Circuit should be reversed.

Respectfully submitted,

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